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Nortel Networks Digital Mobility System Installation and Configuration Guide

NORTEL NETWORKS

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North American Regulatory Information

Safety

This equipment meets all applicable requirements of both the CSA C22.2 No.60950 and UL 60950.

The shock hazard symbol within an equilateral triangle is intended to alert personnel to electrical shock hazard or equipment damage. The following precautions should also be observed when installing telephone equipment.

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when working with telephone lines.

Danger: Risk of shock.
Read and follow installation instructions carefully.
Ensure the system and system expansion units are unplugged from the power socket and that any telephone or network cables are unplugged before opening the system or system expansion unit.
If installation of additional hardware and /or servicing is required, disconnect all telephone cable connections prior to unplugging the system equipment.
Ensure the system and system expansion units are plugged into the wall socket using a three-prong power cable before any telephone cables are connected.

Caution: Only qualified persons should service the system.
The installation and service of this hardware is to be performed only by service personnel having appropriate training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures to minimize the danger to themselves or other persons.
Electrical shock hazards from the telecommunication network and AC mains are possible with this equipment. To minimize risk to service personnel and users, the system must be connected to an outlet with a third-wire ground. Service personnel must be alert to the possibility of high leakage currents becoming available on metal system surfaces during power line fault events near network lines. These leakage currents normally safely flow to Protective Earth ground via the power cord. Therefore, it is mandatory that connection to an earthed outlet is performed first and removed last when cabling to the unit. Specifically, operations requiring the unit to be powered down must have the network connections (central office lines) removed first.

Enhanced 911 Configuration

Caution: Warning
Local, state and federal requirements for Emergency 911 services support by Customer Premises Equipment vary. Consult your telecommunication service provider regarding compliance with applicable laws and regulations.

Radio-frequency Interference

Warning: Equipment generates RF energy.
This equipment generates, uses, and can radiate radio-frequency energy. If not installed and used in accordance with the installation manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules and with ICES.003, CLASS A Canadian EMI Requirements. Operation of this equipment in a residential area is not permitted and is likely to cause interference.

Repairs to certified equipment should be made by an authorized maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician.

Hearing Aid Compatibility

System telephones are hearing-aid compatible, as defined in Section 68.316 of Part 68 FCC Rules.

Repairs

In the event of equipment malfunction, all repairs to certified equipment will be performed by an authorized supplier.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Important Safety Instructions

The following safety instructions cover the installation and use of the Product. Read carefully and retain for future reference.

Installation

Warning: To avoid electrical shock hazard to personnel or equipment damage observe the following precautions when installing telephone equipment:

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

   This symbol on the product is used to identify the following important information: Use only with a CSA or UL certified CLASS 2 power supply, as specified in the user guide.

Use

When using your telephone equipment, basic safety precautions should always be followed to reduce risk of fire, electric shock and injury to persons, including the following:

1 Read and understand all instructions.

2 Follow the instructions marked on the product.

3 Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

4 Do not use this product near water, for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

5 Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.

6 This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

7 Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.

8 Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

9 Never spill liquid of any kind on the product.

10 To reduce the risk of electric shock do not disassemble this product, but have it sent to a qualified service person when some service or repair work is required.

11 Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- **a** When the power supply cord or plug is damaged or frayed.
- **b** If the product has been exposed to rain, water or liquid has been spilled on the product, disconnect and allow the product to dry out to see if it still operates; but do not open up the product.
- **c** If the product housing has been damaged.
- **d** If the product exhibits a distinct change in performance.

12 Avoid using a telephone during an electrical storm. There may be a remote risk of electric shock from lightning.

13 Do not use the telephone to report a gas leak in the vicinity of the leak.

14 **Caution:** To eliminate the possibility of accidental damage to cords, plugs, jacks, and the telephone, do not use sharp instruments during the assembly procedures.

15 Save these instructions.

International Regulatory Information

CE	**The CE Marking on this equipment indicates compliance with the following:** **This device conforms to Directive 1999/5/EC on Radio Equipment and Telecommunications Terminal Equipment as adopted by the European Parliament And Of The Council.**	

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Hereby, Nortel Networks declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. This equipment has been tested and found to comply with the European Safety requirements EN 60950 and EMC requirements EN 55022 (Class A) and EN 55024. These EMC limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial and light industrial environment.

WARNING

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. The above warning is inserted for regulatory reasons. If any customer believes that they have an interference problem, either because their Nortel Networks product seems to cause interference or suffers from interference, they should contact their distributor immediately. The distributor will assist with a remedy for any problems and, if necessary, will have full support from Nortel Networks.

Safety

WARNING!

Only qualified service personnel may install this equipment. The instructions in this manual are intended for use by qualified service personnel only.

Only qualified persons should service the system.

The installation and service of this hardware is to be performed only by service personnel having appropriate training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures to minimize the danger to themselves or other persons.

Electrical shock hazards from the telecommunication network and AC mains are possible with this equipment. To minimize risk to service personnel and users, the system must be connected to an outlet with a third-wire Earth.

Service personnel must be alert to the possibility of high leakage currents becoming available on metal system surfaces during power line fault events near network lines. These leakage currents normally safely flow to Protective Earth via the power cord. Therefore, it is mandatory that connection to an earthed outlet is performed first and removed last when cabling to the unit. Specifically, operations requiring the unit to be powered down must have the network connections (exchange lines) removed first.

Limited Warranty

Nortel Networks warrants this product against defects and malfunctions during a one (1) year period from the date of original purchase. If there is a defect or malfunction, Nortel Networks shall, at its option, and as the exclusive remedy, either repair or replace the telephone set at no charge, if returned within the warranty period.

If replacement parts are used in making repairs, these parts may be refurbished, or may contain refurbished materials. If it is necessary to replace the telephone set, it may be replaced with a refurbished telephone of the same design and color. If it should become necessary to repair or replace a defective or malfunctioning telephone set under this warranty, the provisions of this warranty shall apply to the repaired or replaced telephone set until the expiration of ninety (90) days from the date of pick up, or the date of shipment to you, of the repaired or replacement set, or until the end of the original warranty period, whichever is later. Proof of the original purchase date is to be provided with all telephone sets returned for warranty repairs.

Exclusions

Nortel Networks does not warrant its telephone equipment to be compatible with the equipment of any particular telephone company. This warranty does not extend to damage to products resulting from improper installation or operation, alteration, accident, neglect, abuse, misuse, fire or natural causes such as storms or floods, after the telephone is in your possession.

Nortel Networks shall not be liable for any incidental or consequential damages, including, but not limited to, loss, damage or expense directly or indirectly arising from the customers use of or inability to use this telephone, either separately or in combination with other equipment. This paragraph, however, shall not apply to consequential damages for injury to the person in the case of telephones used or bought for use primarily for personal, family or household purposes.

This warranty sets forth the entire liability and obligations of Nortel Networks with respect to breach of warranty, and the warranties set forth or limited herein are the sole warranties and are in lieu of all other warranties, expressed or implied, including warranties or fitness for particular purpose and merchantability.

Warranty Repair Services

Should the set fail during the warranty period:
In North America, please call 1-800-574-1611 for further information.
Outside North America, contact your sales representative for return instructions. You will be responsible for shipping charges, if any. When you return this telephone for warranty service, you must present proof of purchase.

After Warranty Service

Nortel Networks offers ongoing repair and support for this product. This service provides repair or replacement of your Nortel Networks product, at Nortel Networks option, for a fixed charge. You are responsible for all shipping charges. For further information and shipping instructions:
In North America, contact our service information number: 1-800-574-1611.
Outside North America, contact your sales representative.

Repairs to this product may be made only by the manufacturer and its authorized agents, or by others who are legally authorized. This restriction applies during and after the warranty period. Unauthorized repair will void the warranty.

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Preface

This guide explains how to install the Nortel Networks Digital Mobility System. This includes the installation and configuration of:

- Digital Mobility Controller (DMC)
- Digital Mobility Base stations (RFP)
- Digital Mobility Repeaters (WRFP)
- Digital Mobility Phones (PP).

The guide also provides you with information about:

- DMC OAM application: the tool you access from your computer and use to configure, operate, administer and maintain the wireless subsystem through the DMC.
- Digital Mobility Service Tool: the tool you access from your computer and use to configure and manage handsets and repeaters.

The DMC OAM application and Digital Mobility Service Tool are separate from the host system configuration tool.

Before you begin

This guide assumes the following:

- you are using one of the following host systems:
  - Norstar MICS 7.0 or greater (Modular Integrated Communications System)
  - Norstar CICS 7.0 or greater (Compact Integrated Communications System)
  - BCM 3.7 or greater (Business Communications Manager)
- that users have a working knowledge of the host system operations.
- that all configuration installers have a working knowledge of the Windows operating system and graphical user interfaces.
- that a site survey has been conducted and the installer has access to these plans.
- the host system is installed and initialized and is working correctly.

DECT and DECT variants

The DMC uses Digital Enhanced Cordless Telephony (DECT), which is a digital wireless technology that has been standardized by the ETSI (European Telecommunications Standard Institute). Although a European standard, the technology has spread worldwide with only minor differences to the frequency band allocated for wireless telephony in different markets. Besides DECT there are four additional variants which in this guide is described as:

- **2G4**: The North American DECT variant operating in the 2.4 GHz frequency band.
- **SAM**: The South American DECT variant operating in the 1900 - 1930 MHz frequency band.
- **China**: Chinese DECT variant operating in operating in the 1900 - 1920 MHz frequency band.

- **Taiwan**: Taiwanese DECT variant operating in operating in the 1880 - 1885 MHz frequency band.

For a complete overview of the countries and their accepted DECT variant, see table below:

Table 1 Countries and DECT variants

Country	Standard	Country	Standard	Country	Standard
Albania	DECT	Estonia	DECT	New Zealand	DECT
Andorra	DECT	Fidji	DECT	Nigeria	DECT
Angola	DECT	Finland	DECT	Norway	DECT
Argentina	SAM	France	DECT	Pakistan	DECT
Australia	DECT	Georgia	DECT	Panama	SAM
Austrial	DECT	Germany	DECT	Paragyuay	SAM
Azerbaijan	DECT	Ghana	DECT	Peru	SAM
Bahamas	SAM	Greece	DECT	Philippines	DECT
Bahrain	DECT	Guatamala	SAM	Poland	DECT
Bangladesh	DECT	Haiti	SAM	Portugal	DECT
Belgium	DECT	Honduras	SAM	Rep. Dominicana	SAM
Benin	DECT	Hong Kong	DECT	Romania	DECT
Bolivia	SAM	Hungary	DECT	Russia	DECT
Bosnia-Herzegovina	DECT	Iceland	DECT	San Marino	DECT
Botswana	China	Indonesia	DECT	Saudi Arabia	DECT
Brazil	SAM	Ireland	DECT	Senegal	DECT
Brunei	DECT	Italy	DECT	Singapore	DECT
Bulgaria	DECT	Kenya	DECT	Slovak Rep.	DECT
Burkina Fasso	DECT	Kuwait	DECT	Slovenia	DECT
Burma	DECT	Latvia	DECT	South Africa	DECT
Cambodja	DECT	Lebanon	DECT	Spain	DECT
Canada	2G4	Liecthenstein	DECT	Sri Lanka	DECT
Chile	SAM	Lithuania	DECT	Swaziland	DECT
China	China	Luxembourg	DECT	Sweden	DECT
Colombia	SAM	Lybia	DECT	Switzerland	DECT
Congo	DECT	Macedonia	DECT	Taiwan	Taiwan
Costa Rica	SAM	Madagascar	DECT	Tanzania	China
Cote d'Ivoire	DECT	Malasyia	DECT	Togo	DECT
Croatia	DECT	Mali	DECT	Tunisia	DECT
Cuba	SAM	Malta	DECT	Turkey	DECT
Cuprys	DECT	Marrocco	DECT	Ukraine	DECT
Czech Rebuplic	DECT	Mexico	SAM	UK	DECT
Denmark	DECT	Moldovia	DECT	United States	2G4
Egypt	DECT	Monaco	DECT	Uruquay	SAM
El Salvador	SAM	Namibia	DECT	Vatican City	DECT
Equador	SAM	Netherlands	DECT	Zimbabwe	DECT

Note: The above table may be subject to changes. To see an updated list, see the DECT Industry Association web site: **www.dect.ch** where a global presence map is available and regularly updated.

DMC GAP compliance

The DMC is fully GAP compliant as per ETSI standards. Being GAP compliant, the DMC supports GAP compatible product as described in the GAP standard. The GAP compliance only secures basic telephony between GAP compatible products from different manufactures. In order to ensure handover between base stations and full functionality on the handset, it is strongly recommended to use only Nortel Network handsets with the DMC and radio infrastructure.

The handsets being supported for basic telephony are the following:

- M DECT C4012 DECT handset
- M DECT C4030 DECT handset
- M DECT C4050 DECT handset

The handsets being supported for full functionality are the following

- Digital Mobility Phone 7420 (only for use in North America)
- Digital Mobility Phone 743X
- Digital Mobility Phone 744X
- Digital Mobility Phone 745X

Handset GAP compatibility

The Nortel Networks handsets are GAP compliant as per the ETSI GAP standard. The GAP compliance does not secure the compatibility of third part handsets on the Nortel Networks system. Likewise, the Nortel Networks handsets cannot be guaranteed to be fully supported on other wireless systems. Therefore, it is recommended only to use Nortel Networks handset with the Nortel Networks wireless system.

How to get help

If you do not see an appropriate number in this list, go to *www.Nortelnetworks.com/support*.

USA and Canada

Authorized Distributors - ITAS Technical Support

Telephone: 1-800-4NORTEL (1-800-466-7835)
If you already have a PIN Code, you can enter Express Routing Code (ERC) 196#.
If you do not yet have a PIN Code, or for general questions and first line support, you can enter ERC 338#.

Website: http://www.nortelnetworks.com/support

Presales Support (CSAN)

Telephone: 1-800-4NORTEL (1-800-466-7835)
Use Express Routing Code (ERC) 1063#

EMEA (Europe, Middle East, Africa)

Technical Support - CTAS

Telephone:

* European Freephone	00800 800 89009
European Alternative/	
United Kingdom	+44 (0)870-907-9009
Africa	+27-11-808-4000
Israel	800-945-9779

* Note: Calls are not free from all countries in Europe, Middle East or Africa

Fax: 44-191-555-7980

email: emeahelp@nortelnetworks.com

CALA (Caribbean & Latin America)

Technical Support - CTAS

Telephone: 1-954-858-7777

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APAC (Asia Pacific)

Technical Support - CTAS

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Australia 1800NORTEL (1800-667-835)

China 010-6510-7770

India 011-5154-2210

Indonesia 0018-036-1004

Japan 0120-332-533

Malaysia 1800-805-380

New Zealand 0800-449-716

Philippines 1800-1611-0063

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South Korea 0079-8611-2001

Taiwan 0800-810-500

Thailand 001-800-611-3007

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Chapter overview

Chapter 1 introduces the different components of a Nortel Networks wireless system.

Chapter 2 describes the process of installing the Nortel Networks digital wireless system for host systems and provides information on the different configuration tools and their features.

Chapter 3 describes the process of installing the DMC and connecting the DMC to the host system.

Chapter 4 describes the process of installing the base stations.

Chapter 5 describes the process of installing repeaters and external antennas.

Chapter 6 describes how to prepare the handsets for use.

Chapter 7 describes how to connect the DMC to the computer and how to configure the DMC.

Chapter 8 describes the process of registering and subscribing handsets.

Chapter 9 provides information on handset management.

Chapter 10 provides information about the DMC OAM program and the Digital Mobility Service Tool and describes how the programs are used for system management.

Acronyms

AC	Authentication Code
ARI no.	Access Rights Identity - Serial number of the DMC
dB	Decibels (deciBells)
DECT	Digital Enhanced Cordless Telecommunications
DMC	Digital Mobility Controller - controller hardware
DN	Directory Number
e.i.r.p.	Equivalent Isotropic Radiated Power
GAP	Generic Access Profile
HW PCS	Hardware Product Change Status - Hardware edition
IPEI	International Portable Equipment Identity - Serial number of the handset - SN
IWU	Inter Working Unit
KSU	Key System Unit - Nortel Networks host system
MMI	Man Machine Interface
MSF	Message Service Function
MWI	Message Waiting Indication
OAM	Operation, Administration and Maintenance
PB	Print circuit board
PBA	Print circuit board assembly
PBX	Private Branch eXchange
PCS	Product Change Status (Edition)
PIE	Production Initial Edition
PP	Portable Part - Wireless handset
RFP	Radio Fixed Part - Wireless base station
RPN	Radio Part Number - Wireless base station number
SAM	South American Markets
SW PCS	Software Product Change Status - Software edition
TCM	Time Compression Multiplexing - digital lines or digital loops
WRFP	Wireless Radio Fixed Part - Wireless Repeater

Chapter 1
Overview

This section provides information about the system components in the Digital Mobility System.

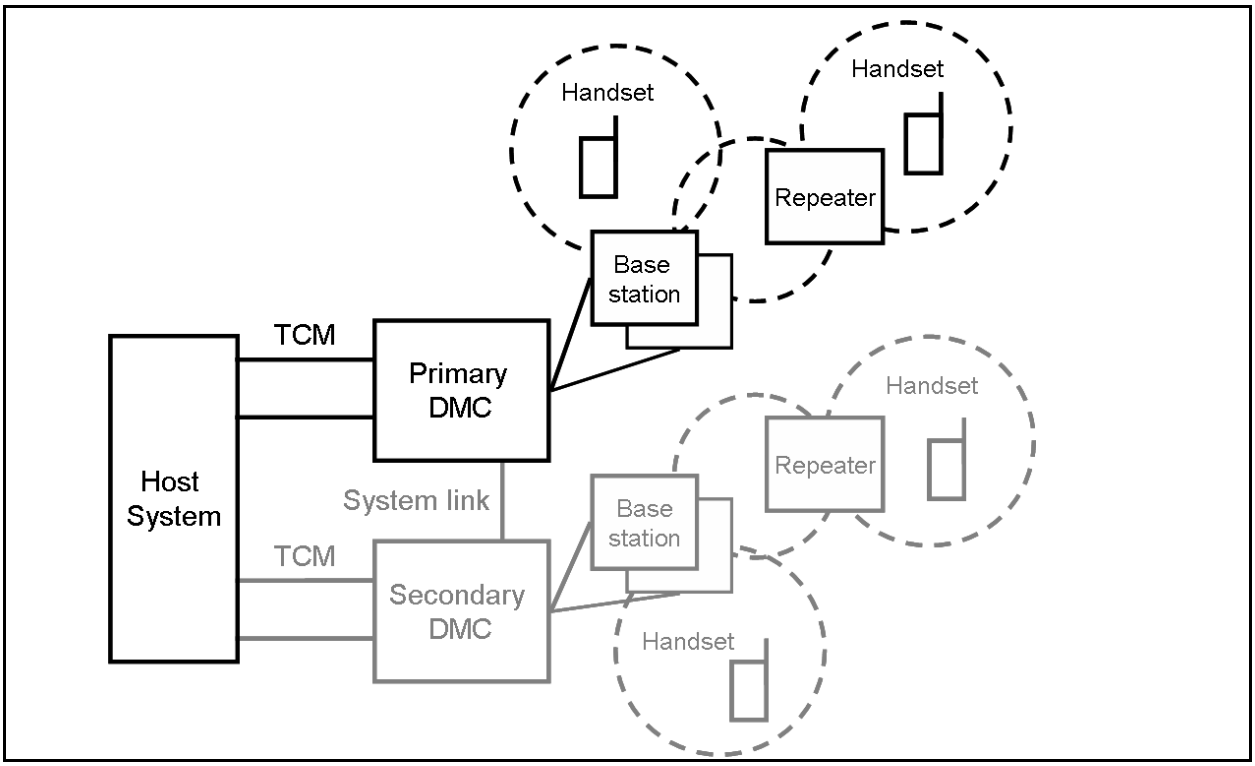
This section includes information about:

- "Digital Mobility system diagram" on page 27
- "General system information" on page 28

Digital Mobility system diagram

The following figure provides an overview of the whole system.

Figure 1 Digital Mobility system diagram



General system information

This section provides information about:

- "Components of the system" on page 28
- "Description of connectors and their placement" on page 33

Components of the system

This section provides information about:

- "Digital Mobility Controller (DMC)" on page 28
- "Digital Mobility Base station (RFP)" on page 29
- "Digital Mobility Repeater (WRFP)" on page 30
- "Digital Mobility Phone (PP)" on page 31
- "Administration and maintenance tools" on page 32

Digital Mobility Controller (DMC)

The Digital Mobility Controller is the mobility subsystem component which connects to the Nortel Networks host system. The DMC together with the host system handles the routing of telephone calls between the base stations and the host system.

The DMC is available in two versions:

- DMC080 - supporting up to two base stations and eight TCM loops for support of eight handsets.
- DMC320 - supporting up to eight base stations and 32 TCM loops for support of 32 handsets.

It is possible to link two systems together to make a number of different host system-DMC configurations:

Table 2 Host system - DMC configurations

Primary DMC	Secondary DMC	Maximum number of		
		Base stations	TCM loops	Handsets
DMC080	(none)	2	8	8
DMC080	DMC080	2 + 2 = 4	8 + 8 = 16	16
DMC320	(none)	8	32	32
DMC080	DMC320	2 + 8 = 10	8 + 32 = 40	40
DMC320	DMC080	8 + 2 = 10	32 + 8 = 40	40
DMC320	DMC320	8 + 8 = 16	32 + 32 = 64	64

See "Digital Mobility system diagram" on page 27 for an illustration of the Primary - Secondary configuration.

Digital Mobility Base station (RFP)

The base stations are positioned in the area to send and receive calls between the host system and the handset. The base station contains internal antennas and handles four speech channels simultaneously. A base station is able to synchronize with other base stations. When the base station is synchronized with other base stations, a person speaking in a handset can move between base stations without any interference.

Note: Whether the base station is connected to the Primary or Secondary DMC is of no importance to the synchronization as a base station is synchronized automatically when performing cable delay measurement. Refer to "Connecting DMC to host system (TCM loop)" on page 63 for more information on cable delay measurement.

Transmission length is up to 1.5 km on a twisted standard pair category 4 cable, between the base station and the DMC. From this connection the base station is supplied with power from the DMC (max. supply 1.5 W). The radius coverage of the base station is 600 meters with a Digital Mobility handset in free sight.

Coverage area decreases depending on choice of building materials and obstructive elements. To ensure proper coverage in the areas required, it is necessary to conduct a site survey and deployment by certified technicians.

The host system supports the following wireless base stations:

- Digital Mobility Base station 10 (2.4 GHz frequency band)
- Digital Mobility Base station 12 (1900 - 1920 MHz frequency band)
- Digital Mobility Base station 13 (1880 - 1885 MHz frequency band)
- Digital Mobility Base station 14 (1900 - 1930 MHz frequency band)
- Digital Mobility Base station 15 (DECT)

Refer to "Base station installation" on page 65.

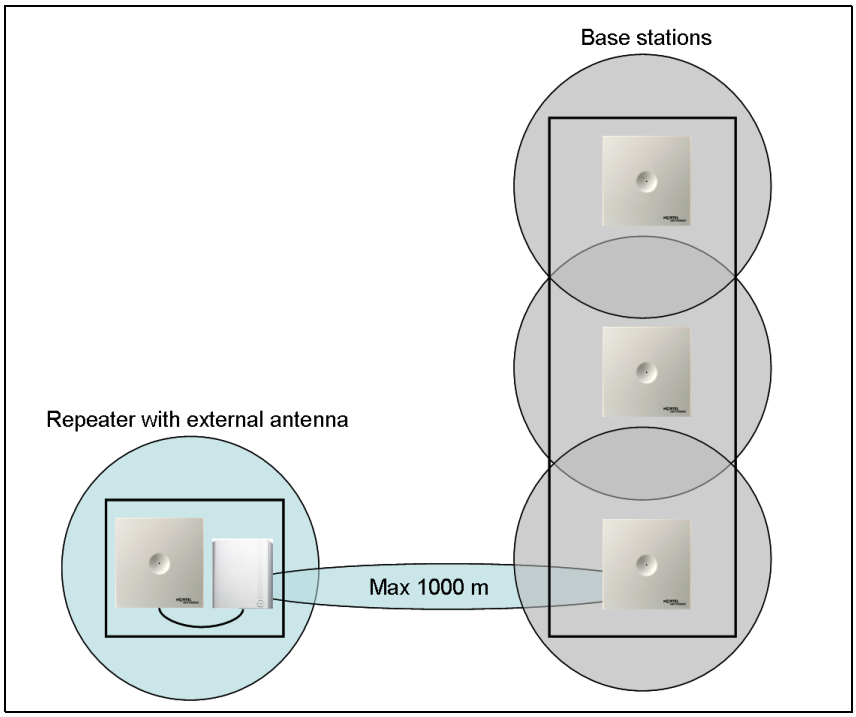
Digital Mobility Repeater (WRFP)

The repeater is available as a half slot or full slot repeater. A half slot repeater covers two simultaneous speech channels; a full slot repeater covers four simultaneous speech channels. These channels are borrowed from the attached base stations, and are not additional channels to the system total number of channels. A full slot repeater increases the coverage area. A half slot repeater also increases the coverage area but with reduced capacity.

Note: The repeater does not increase the traffic capacity. Instead, it increases the radio coverage area of the system by a maximum of 50 per cent.

The repeater has two internal antennas which are used for increasing the effective range of a base station in a certain direction. The repeater is also available with a connector for a third external antenna (directional antenna) which can be used to create a new coverage cell up to 1000 meters away from the base station.

Figure 2 Repeater with external antenna



The digital repeater relays the radio signals between the handsets and the base station, making it a wireless component from the DMC.

Note: The repeater is powered with a 9.0VDC - 300mA transformer. Therefore, it needs a power source within three meters.

The host system supports the following wireless repeaters:

- Digital Mobility Repeater 20 (2.4 GHz frequency band)
- Digital Mobility Repeater 22 (1900 - 1920 MHz frequency band)
- Digital Mobility Repeater 23 (1880 - 1885 MHz frequency band)
- Digital Mobility Repeater 24 (1900 - 1930 MHz frequency band)
- Digital Mobility Repeater 25 (1880 - 1900 MHz frequency band) (DECT)

Refer to "Repeater installation" on page 71.

Digital Mobility Phone (PP)

The host system supports the following wireless handsets:

- Digital Mobility Phone 7420 (only for use in North America)
- Digital Mobility Phone 743X
- Digital Mobility Phone 744X
- Digital Mobility Phone 745X

where X represents the frequency variant of the models:

- 0 = (2.4 GHz frequency band)
- 2 = (1900 - 1920 MHz frequency band)
- 3 = (1880 - 1885 MHz frequency band)
- 4 = (1900 - 1930 MHz frequency band)
- 5 = (1880 - 1900 MHz frequency band) (DECT)

Refer to "Preparing handset for use" on page 83.

Refer to "DECT and DECT variants" on page 21 for more information about DECT and frequency variants.

The handsets used with the DMC are uniquely designed as small, lightweight units with an extensive feature list. Refer to "Host system and handset interoperability" on page 111.

All handsets have a display. The displays has a three-line capacity. Each line is 16 alphanumeric characters wide. There are also five functional icons that may appear on the display. These features are described in the *Digital Mobility Phone User Guide*.

Administration and maintenance tools

Programming of the DMC is performed using the DMC OAM program or a Master handset. You can use either of these to register handsets to the system, check system parameters, and check messaging profiles. The DMC can be accessed remotely through a modem or IP connection through a serial-IP converter to perform maintenance and system updates. This part of the OAM should only be used by certified technicians. Refer to "Connecting a computer to the DMC" on page 92 for more information about accessing the DMC.

Refer to "Serial port" on page 34 for more information about the serial connection for initial configuration.

Description of connectors and their placement

On the DMC there is a faceplate with the connections for the wireless system:

Figure 3 Faceplate on DMC080

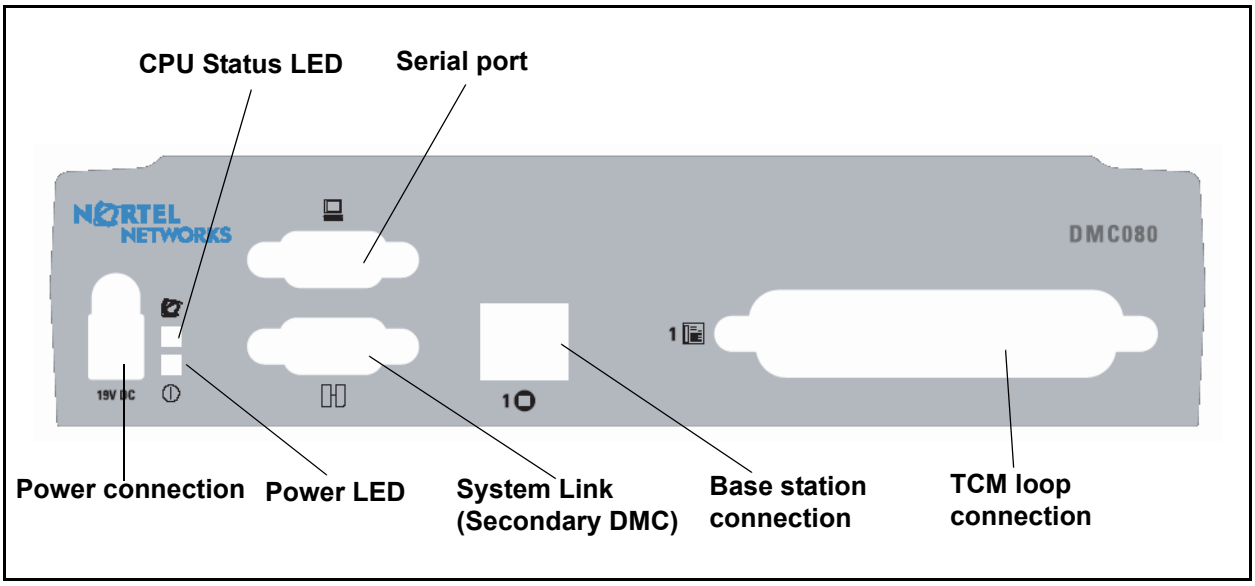
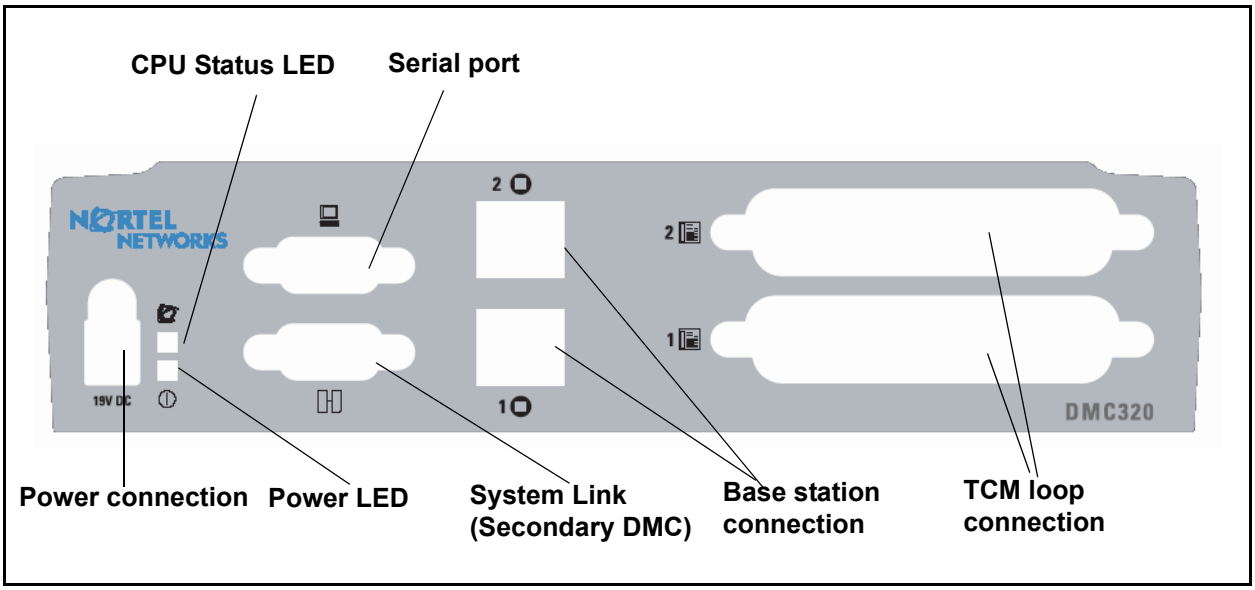


Figure 4 Faceplate on DMC320



System Status LEDs

The DMC has two visual status monitor indicators (bi-color LEDs) on the faceplate (Power LED and CPU Status LED). The functions of the LEDs are given in the table below:

Table 3 System status monitor indicators

	Green LED		OFF	Red LED	
	Solid	Flashing		Solid	Flashing
Power	OK	N/A	No Power	N/A	N/A
CPU Status	OK	Start	No OS	Major Issue	N/A

- Initially on power up, the Power LED will be set to Green and the CPU Status LED will be set to OFF.
- As the boot code starts (takes a few seconds), it will set the CPU Status LED to Green Flashing.
- When the operating system (OS) is up, the CPU Status LED will be set to Green Solid.

System link (Secondary DMC)

The System link connection is a 9-pin DSUB9 socket for clocks, synch, ADPCM and RS485 link between the Primary and Secondary DMC. The maximum length of the cable is one meter.

Note: To set up a linked system a separate orderable link cable is required.

Serial port

The Serial port connector is a male DB9. A null-modem cable is used to connect the computer to the DMC for initial configuration of the DMC and for maintenance using the DMC OAM program.

Base station connection

The connection for the base station is a single RJ45 socket on the DMC080. This socket allows a maximum of two base stations to connect to the DMC. The DMC320 has two RJ45 sockets, one above the other, which allow a maximum of four base stations to connect to each socket, for a total of eight base stations per DMC320.

TCM loop connection

The TCM loop connector is a 50-pin amphenol connector with eight TCM loops for the DMC080 and 16 TCM loops for the DMC320. The DMC320 has two TCM connectors which support a total of 32 TCM loops.

Power connection

The connection to the power supply is 19 V DC.

Chapter 2
Installation overview

This section gives an overview of the process of installing the Nortel Networks digital wireless system for host systems. The host system is the Nortel Networks small business system to which the DMC connects. The section also describes how to install the DMC OAM program and Digital Mobility Service Tool and provides information on the different configuration tools and their features.

The information in this guide is based on the following understandings:

- A site survey is complete and available, and you determined the exact locations of the base stations around the site.
- You determined how many handsets that will be required.
- The host system is installed and initialized and has been tested.

  The host system hardware must be in place and configured before you can use the handsets to connect to the host systems. This guide describes the installation of the various pieces of hardware and software.

Caution: None of the equipment can be installed outdoors.

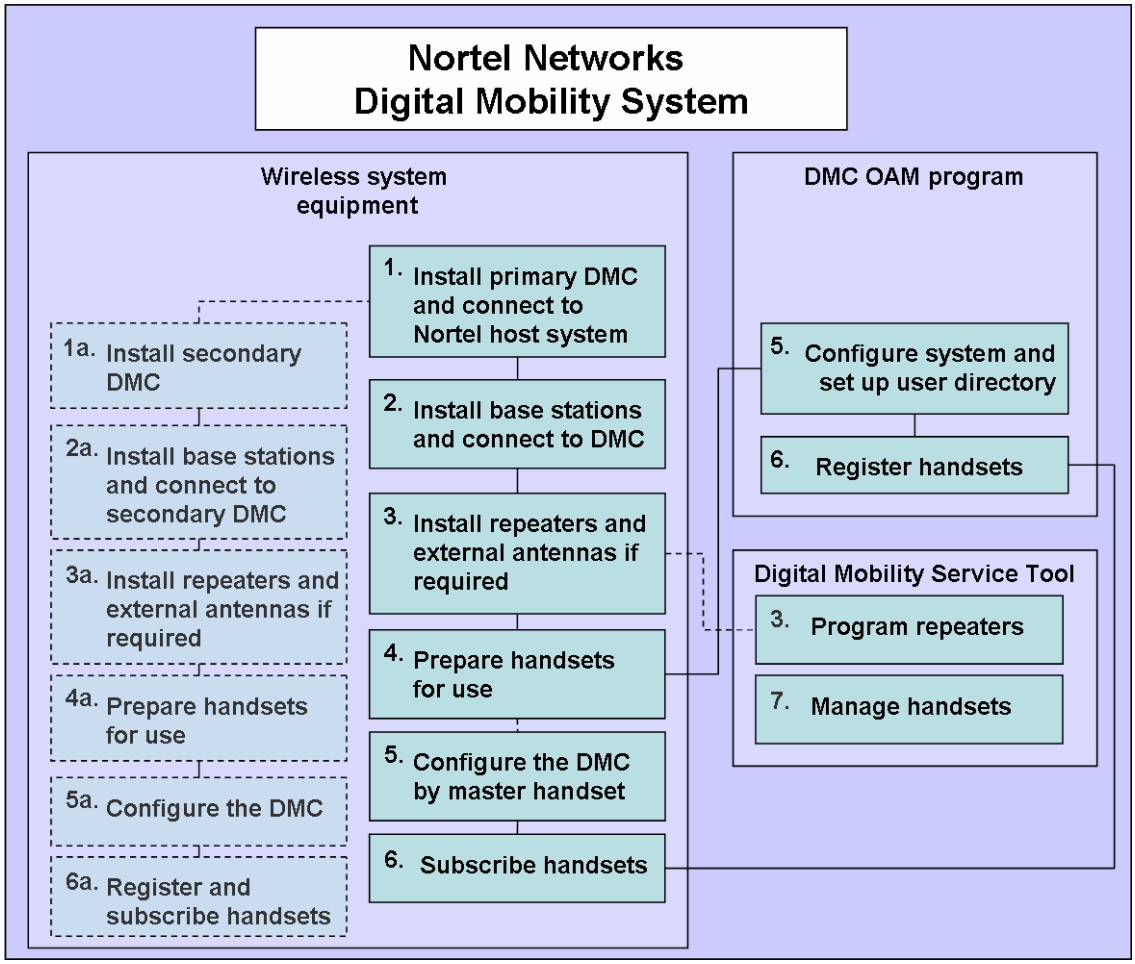
This section contains the following information:

- "Installation process map" on page 38
- "Host system setup requirements" on page 39
- "Requirements for the digital mobility subsystem" on page 39
- "Installation prerequisites" on page 44
- "Installing DMC OAM and Digital Mobility Service Tool" on page 45
- "Description of the DMC OAM program interface screen" on page 49
- "Description of the Digital Mobility Service Tool" on page 51
- "Description of the Master handset interface" on page 53

Installation process map

The following figure provides an overview of the process for installing the support hardware and software for a Nortel Networks Digital Mobility System.

Figure 5 Installing Nortel Networks support hardware and software


Nortel Networks
Digital Mobility System
Wireless system equipment
1. Install primary DMC and connect to Nortel host system
1a. Install secondary DMC
2. Install base stations and connect to DMC
2a. Install base stations and connect to secondary DMC
3. Install repeaters and external antennas if required
3a. Install repeaters and external antennas if required
4. Prepare handsets for use
4a. Prepare handsets for use
5. Configure the DMC by master handset
5a. Configure the DMC
6. Subscribe handsets
6a. Register and subscribe handsets
DMC OAM program
5. Configure system and set up user directory
6. Register handsets
Digital Mobility Service Tool
3. Program repeaters
7. Manage handsets

Host system setup requirements

Task	Where to find information
Wiring and TCM loop connections to host system	BCM: Installation and Maintenance Guides Norstar: Installer Guides
Digital station module	BCM: Programming and Operations Guides Norstar: Installer Guides
DN record configuration Refer to "Telephone settings" on page 112	
Configuring and using features Refer to "Host system and handset interoperability" on page 111.	BCM: Telephony Feature Handbook and Telephone Feature User Guide Norstar: System Coordinator Guides and Telephone Feature User Card
Recording information	Programming Records

Requirements for the digital mobility subsystem

This section provides information about the environmental and electrical requirements and software requirements for the digital mobility subsystem.

The section contains information about the different requirements for:

- "Digital Mobility Controller" on page 39
- "Base stations and repeaters" on page 41
- "Handsets" on page 43
- "DMC OAM program and Digital Mobility Service Tool" on page 43

Digital Mobility Controller

This section provides information you need to know before you install the DMC and contains the following information:

- "Environmental checklist" on page 40
- "Electrical requirements" on page 40
- "Internal wiring requirements" on page 41

Before you install the DMC, complete the following actions:

- Determine the location for the DMC and other equipment based on spacing and electrical requirements. For more information about spacing and electrical requirements, refer to the "Environmental checklist" on page 40 and the "Electrical requirements" on page 40.
- Order the required trunks from the central office (not relevant to a Secondary DMC).
- Check that the number of TCM loops required for the handsets are available on the host system.
- Ensure that you have all the equipment and supplies you require to install the DMC.

Environmental checklist

The installation area must:

- be minimum of four meters from equipment, such as photocopiers, electrical motors, and other equipment that produces electromagnetic, radio frequency, and electrostatic interference
- be within 1.5 meters of a three-wire grounded electrical outlet
- be clean, free of traffic and excess dust, dry, and well ventilated
- be within the temperature ranges of 10°C and 40°C
- be between 20% and 80% non-condensing relative humidity
- provide enough space and strength to support the DMC
- minimum of 46 cm from the floor

  Note: The installation area must be of sufficient height from the floor to prevent water damage.

Electrical requirements

The following electrical requirements must be met:

- Power must be supplied from a non-switched, unobstructed outlet within 1.5 meters of the DMC.
- The supplied power must be a dedicated 110 V to 120 V ac nominal (or 220 V to 230 V ac nominal), 50/60 Hz, 15 A minimum service with a third wire safety ground. The third wire safety ground provides shock protection and avoids electromagnetic interference.

Danger: Risk of electric shock.

The safety of this product requires connection to an outlet with a third wire ground. Use only with the supplied DMC power supply and a three wire power outlet.

Caution: Check ground connections.

Ensure that the electrical ground connections of the power utility, telephone lines and internal metal water pipe system, if present, are connected together. If these ground connections are not connected together, contact the appropriate electrical inspection authority. Do not try to make the connections yourself.

The DMC power supply cord is 1.5 meters long. You can connect the power cord to a power bar with a max. length of two meters, including power bar. You must use a power bar approved by an appropriate National Certification Body, with a third wire ground. Do not use an extension cord between the DMC and the power bar, or between the power bar and the electrical outlet.

Internal wiring requirements

This section describes the requirements for a TCM (Time Compression Multiplexing) loop between the DMC and host system.

TCM loop

The following parameters must be met for a TCM loop:

- one twisted-pair cable(s) per handset
- cable length (0.5 mm or 24 AWG) 15 meters or less
- no bridge taps

Base stations and repeaters

This section provides information you need to know before you install the base stations and repeaters and contains the following information:

- "Environmental checklist" on page 41
- "Electrical requirements" on page 42

Environmental checklist

- Avoid installing base stations and repeaters on large concrete or marble columns because these columns affect radio coverage. If possible, place the base station a minimum of one meter from these types of columns.
- Do not install a base station or repeater with the antenna housings near metal objects. Be careful not to damage existing wiring or panels.
- Do not position base stations and repeaters in ducts, plenums, or hollow spaces used to transport environmental air except where the duct, plenum or hollow space is created by a suspended ceiling having lay-in panels. When you need more than one base station in a cell to meet traffic requirements, position the base stations at the same cell center.

- Keep the base station and repeater away from steel constructions.
- Do not position base stations and repeaters directly on metallic surfaces. If possible, place the base station a minimum of one meter from these types of surfaces.
- Do not position base station and repeaters behind furniture.
- Only position base stations and repeaters where the signal is needed.
- The external antenna used for the transmitter is to be fixed-mounted on indoor permanent structures providing a separation distance of at least 20 cm from all persons during normal operation and must not be co-located or operating in conjunction with any other antenna or transmitter. The external antenna can be placed a maximum of one meter from the repeater and must be placed in the direction of the base station that the repeater should synchronize with. If the external antenna and repeater is part of a repeater jump, the antenna should be directed towards the repeater to be synchronized with.
- The installation area must be clean, free of traffic and excess dust, dry, and well ventilated.
- The installation area must be within the temperature ranges of 10°C and 40°C.
- The installation area must be between 20% and 80% non-condensing relative humidity.
- Minimum distance between two base stations varies depending on material and construction of buildings, but there must always be a radio coverage overlap between the two base stations. The time it takes a person to cross the common coverage area must be 10 seconds or more, as the handset needs time to scan for an alternative base station.

Electrical requirements

The following electrical requirements must be met:

- The base station operate on standard two wired (twisted pair) telephone cable - Cat. 4 - to prevent disturbances from other equipment.
- The minimum voltage at the end of the cable where the base station is connected must never drop below 25Vdc with respect to the current consumption of the base station similar to 18mA (0.8W).
- The max. radiated output power for the antenna is 1W e.i.r.p.

Handsets

This section provides information you need to know before you use a handset and contains the following information:

- "Environmental checklist" on page 43
- "Electrical requirements" on page 43

Environmental checklist

- The area where the handset is used must be within the temperature ranges of 10°C and 40°C.
- For correct battery charging, the room temperature must be between 0°C and 25°C. Therefore, the handset must not be placed in direct sunlight. The battery has a built-in heat sensor which will stop charging if the battery temperature is too high.
- For detailed battery information, refer to "Battery information" on page 84.
- The area where the handset is used must be between 20% and 80% non-condensing relative humidity.

Electrical requirements

The following electrical requirement must be met:

- The supplied power for the charger must be 110 V to 120 V ac nominal (or 220 V to 230 V ac nominal), 50/60 Hz.

DMC OAM program and Digital Mobility Service Tool

This section describes the computer and hardware requirements to run the two DMC tools.

Software requirements

- OS: Windows 98SE, Windows 2000 and Windows XP.
- CPU: minimum 200MHz (Intel / AMD).
- RAM: minimum is the recommended amount of RAM for the OS + 10 MB.

Customer-supplied hardware requirements

- null-modem cable (not included with DMC hardware)
- modem (for remote connection) (optional)
- serial-IP converter (for remote connection) (optional)

Installation prerequisites

Note: In the host system programming records you will find a chart that installers can use to write down base station number and location, repeater number and location, serial numbers, and ARI codes.

Before you start the installation you need to find the following information and perform the following tasks:

- ARI codes (serial numbers) for DMC (see label on the rear of the DMC unit)
- Serial numbers for handsets (see label behind the battery - or press *99984*✓/**OK** on the handset to display the serial number). Refer to "Reading serial number" on page 88.
- AC codes (authentication codes)

  The AC is a customer-defined optional subscription pin code of a maximum of eight digits for the individual handset. The AC can be used when connecting the handset to the DMC.
- Base stations:

  Mark each base station with the number corresponding to the DMC port. This ensures that the positions of the base stations are known, allowing for easier maintenance of the system.
- Repeaters:

  Mark each repeater with the number of the related base station. This way you can easily configure the system on site.
- Handsets:

  To use the DMC handsets, you must first install the radio infrastructure, e.g. base stations and repeaters to transmit and receive radio signals to and from the handsets. There are no direct connections between the handset and the system. For more information about base station and repeater installation, refer to "Base station installation" on page 65 and "Repeater installation" on page 71.
- Charging battery

  When charging the handset battery for the first time, leave the handset in the charger for 14 - 16 hours to ensure that the battery is fully charged and the handset ready for use. Refer to "Charging battery" on page 87.

Installing DMC OAM and Digital Mobility Service Tool

Where you obtain the DMC OAM and the Digital Mobility Service Tool applications will depend on the type of host system.

- On Norstar systems (MICS and CICS), you download the installation wizard from the *Modular and Compact ICS Documentation and Client Software* CD.
- From Business Communications Manager systems, download the application from under the Unified Manager **Client Install** button.

Once you download the applications to your computer, install them by clicking on the **Digital_Mobility_Controller_1.XX.X.XX_setup.exe** and **Digital_Mobility_Service_Tool_1.XX.X.XX_setup.exe** icon and by following the resulting Install Wizard prompts.

Starting the DMC OAM program

When you have the DMC OAM application installed, start it from your computer:

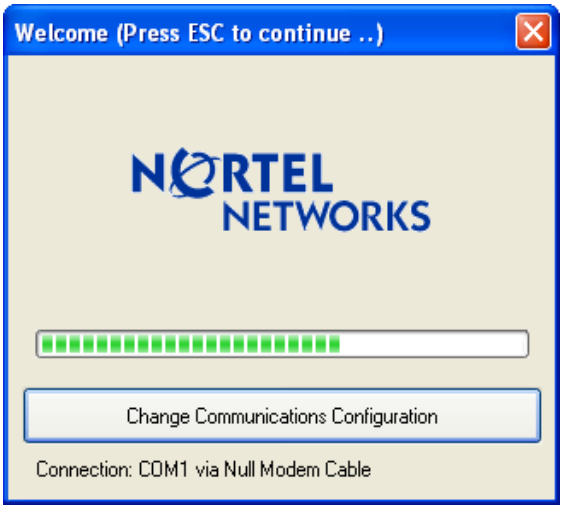
1 Ensure that the DMC is powered up and connected to a computer.

Refer to "Connecting a computer to the DMC" on page 92 for more information about connecting a computer to the DMC.

2 Double-click the DMC OAM icon or locate the program under the Start menu to open the DMC OAM program on your desktop.

A start-up window appears.

Figure 6 DMC OAM startup window



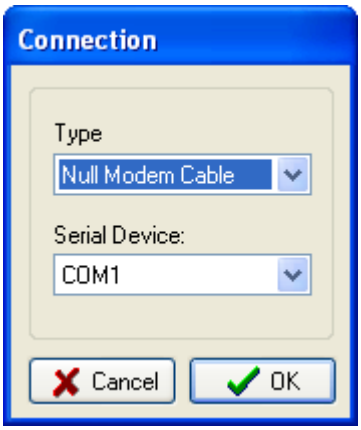
The lower part of the window shows the current communication settings used for connecting to the DECT system. The default communication setting is COM1 via null-modem cable for direct connection.

Table 4 Default Com port setting

Baud:	115200 bit/sec.
Data bit:	8
Parity:	None
Stop bit:	1
Flow control:	Hardware: DCD, DSR, DTR, CTS, RTS

A delay of three seconds gives the user a chance to select a different communication setting, by clicking **Change Communications Configuration**.

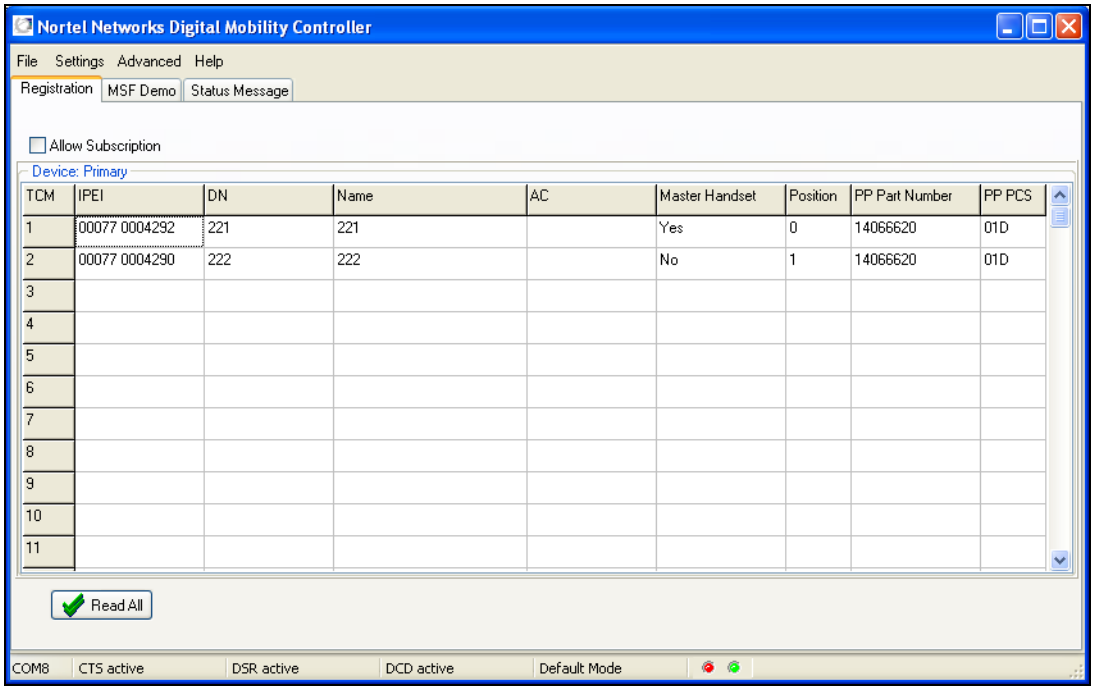
Figure 7 DMC OAM Connection dialog



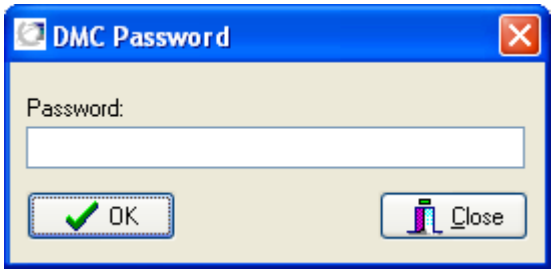
- For modem connection, select **Modem**, then select the Com port to which the modem is installed, and then click **OK**.
- For remote connection via a RS232 serial-IP converter, select **Null Modem Cable**, then select the Com port to which the IP connection has been installed, and then click **OK**.

3 After a caution message (*DMC detected*) the DMC OAM program window appears.

Figure 8 DMC OAM Registration window



4 You will be prompted a password to access the program. The default password is: **default**.



For information on changing password, see "Change password" on page 95.

Exiting the DMC OAM program

On the **File** menu, click **Exit**.

This will quit the DMC OAM program.

Starting the Digital Mobility Service Tool

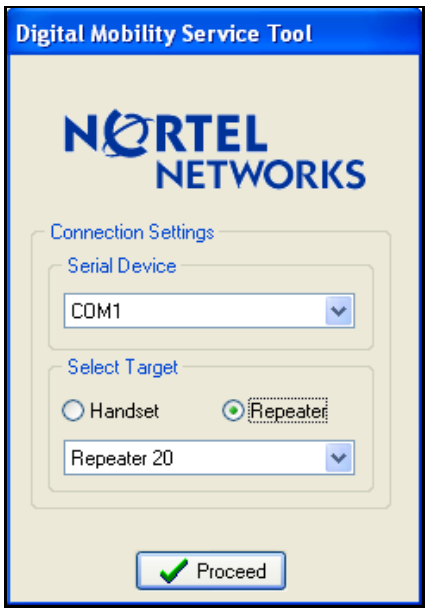
Connect to the repeater or handset, as described in "Set up of the hardware for repeater programming:" on page 77 and "Set up of the hardware for handset adjustment:" on page 133.

Perform the following steps to start the Digital Mobility Service Tool application:

1. On the desktop, click the Start button
2. Point to Programs and find and click on **Digital Mobility Service Tool**.

   A start-up window appears.

Figure 9 Start-up window for Digital Mobility Service Tool



Exiting the Digital Mobility Service Tool

On the **File** menu, click **Exit**.

This will quit the Digital Mobility Service Tool.

Description of the DMC OAM program interface screen

This section provides you with information about the DMC OAM application screens.

With the DMC OAM program you can manage text messages, status information and registration of handsets. The DMC OAM program also provides maintenance features for maintaining the system.

Warning: Change the access password to the DMC OAM program at the earliest opportunity. Refer to "Change password" on page 95 for the procedure for changing passwords.

The purpose of each window, menu, tab, and command is described in this section.

This section includes information about:

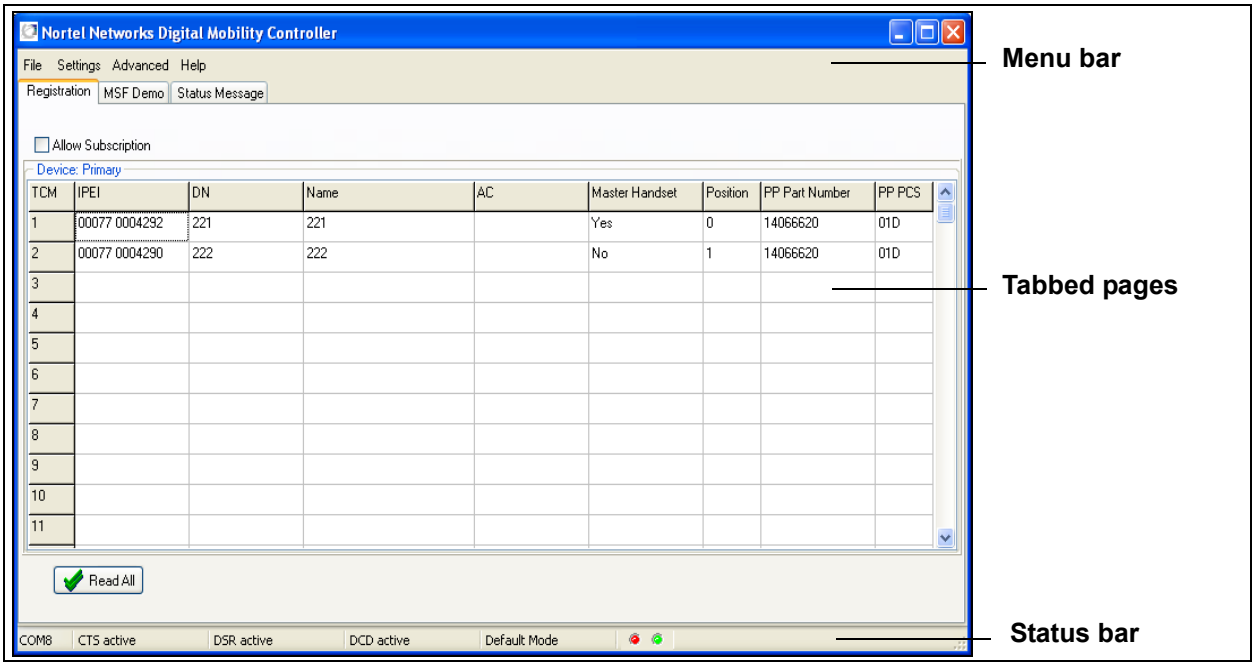
- "DMC OAM program main window" on page 49
- "Understanding the menu" on page 50
- "Understanding tabbed pages" on page 50

DMC OAM program main window

The DMC OAM program main window, shown in the figure below, consists of:

- a menu bar, where users access operation, administration, and management commands
- tabbed pages, where users register handsets, send MSF Messages, and receive status messages
- a status bar, showing status of the different actions going on

Figure 10 Main window of the DMC OAM program


Nortel Networks Digital Mobility Controller
File Settings Advanced Help
Registration MSF Demo Status Message
Allow Subscription
Device: Primary
TCM IPEI DN Name AC Master Handset Position PP Part Number PP PCS
1 00077 0004292 221 221 Yes 0 14066620 01D
2 00077 0004290 222 222 No 1 14066620 01D
Read All
COM8 CTS active DSR active DCD active Default Mode
Menu bar
Tabbed pages
Status bar

The menu bar contains configuration management options. When you select the different menus dropdown boxes with commands appear.

Understanding the menu

The following table defines the DMC OAM menu bar top-level items.

Table 5 Menu bar items

Menu item	Description
File	Exits the program
Settings	Access information, administration, and management dialog boxes and screens
Advanced	Access administration and management dialog boxes and screens
Help	Access system information

Understanding tabbed pages

The tabbed pages are accessed by clicking the appropriate tab at the top of the screen.

Figure 11 Tabbed page example

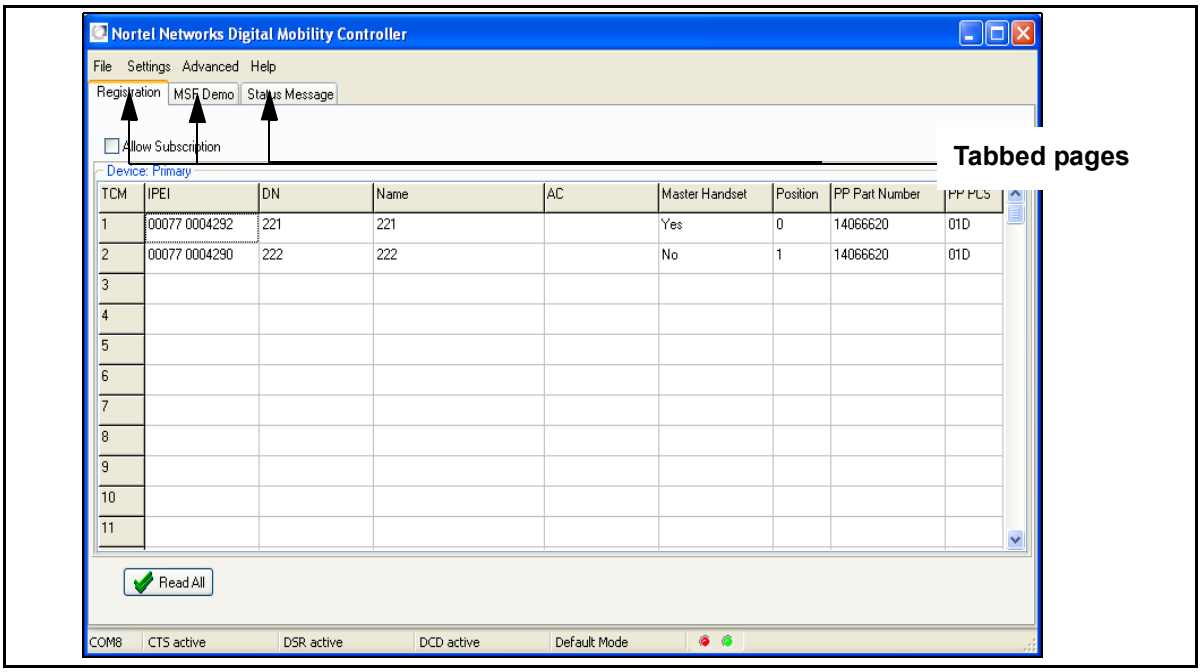


Table 6 Tabbed pages

Tab	Description
Registration	Registration of handsets
MSF Demo	Sending text messages to any MSF compatible handset connected to the DMC

Table 6 Tabbed pages (Continued)

Tab	Description
Status Message	Reading status messages from the DMC

Description of the Digital Mobility Service Tool

This section provides you with information about the Digital Mobility Service Tool. This is the software tool you use on your desktop to access programming for repeaters and handset management. The Digital Mobility Service Tool is also used for downloading software to the handsets and repeaters.

The purpose of each menu, tab, and command in the Digital Mobility Service Tool is described in this section.

This section includes information about:

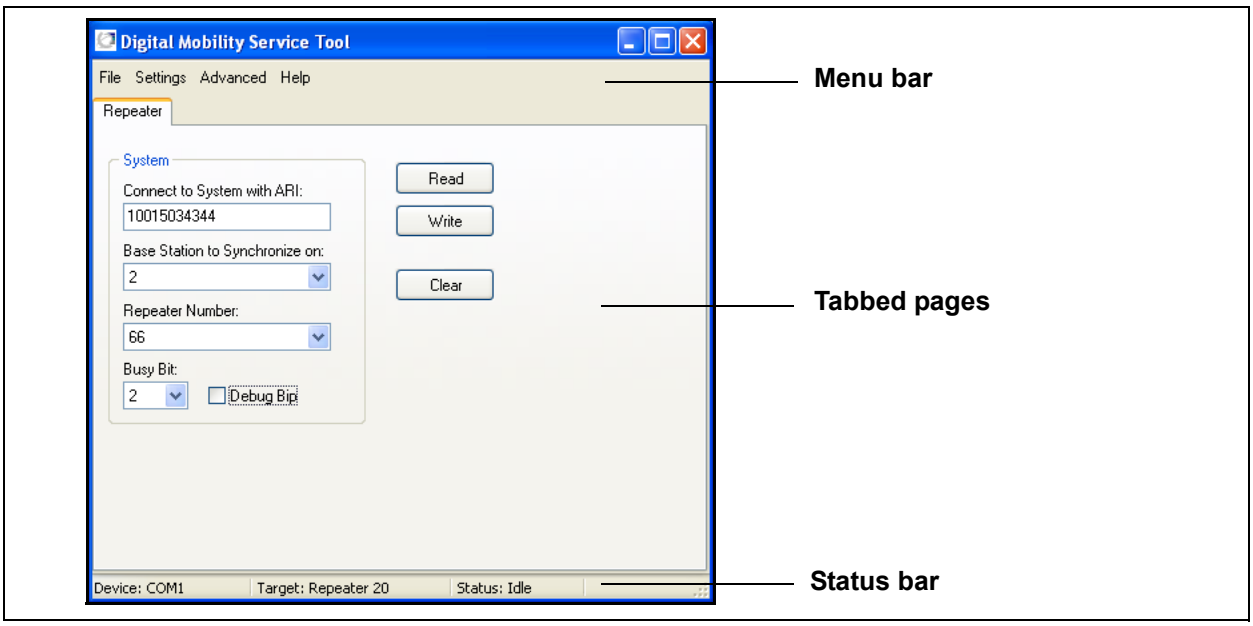
- "Digital Mobility Service Tool main window" on page 51
- "Understanding the menu" on page 52
- "Understanding tabbed pages" on page 52

Digital Mobility Service Tool main window

The Digital Mobility Service Tool main window, shown in the figure below, consists of:

- a menu bar, where users access operation, administration, and management commands.
- tabbed pages, where users can program repeaters and adjust handset settings.
- a status bar, showing status of the different actions going on.

Figure 12 Main window of the Digital Mobility Service Tool



The menu bar contains configuration management options. When you select the different menus dropdown boxes with commands appears.

Understanding the menu

The following table defines the Service Tool menu bar top-level items.

Table 7 Menu bar items

Menu item	Description
File	Exits the program
Settings	Choose between Com ports, handset and repeater models
Advanced	Software downloads
Help	Access system information

Understanding tabbed pages

Depending on the selected target, the DCM Tool shows a **Repeater** tab or a **Handset** tab.

Figure 13 Tabbed page example

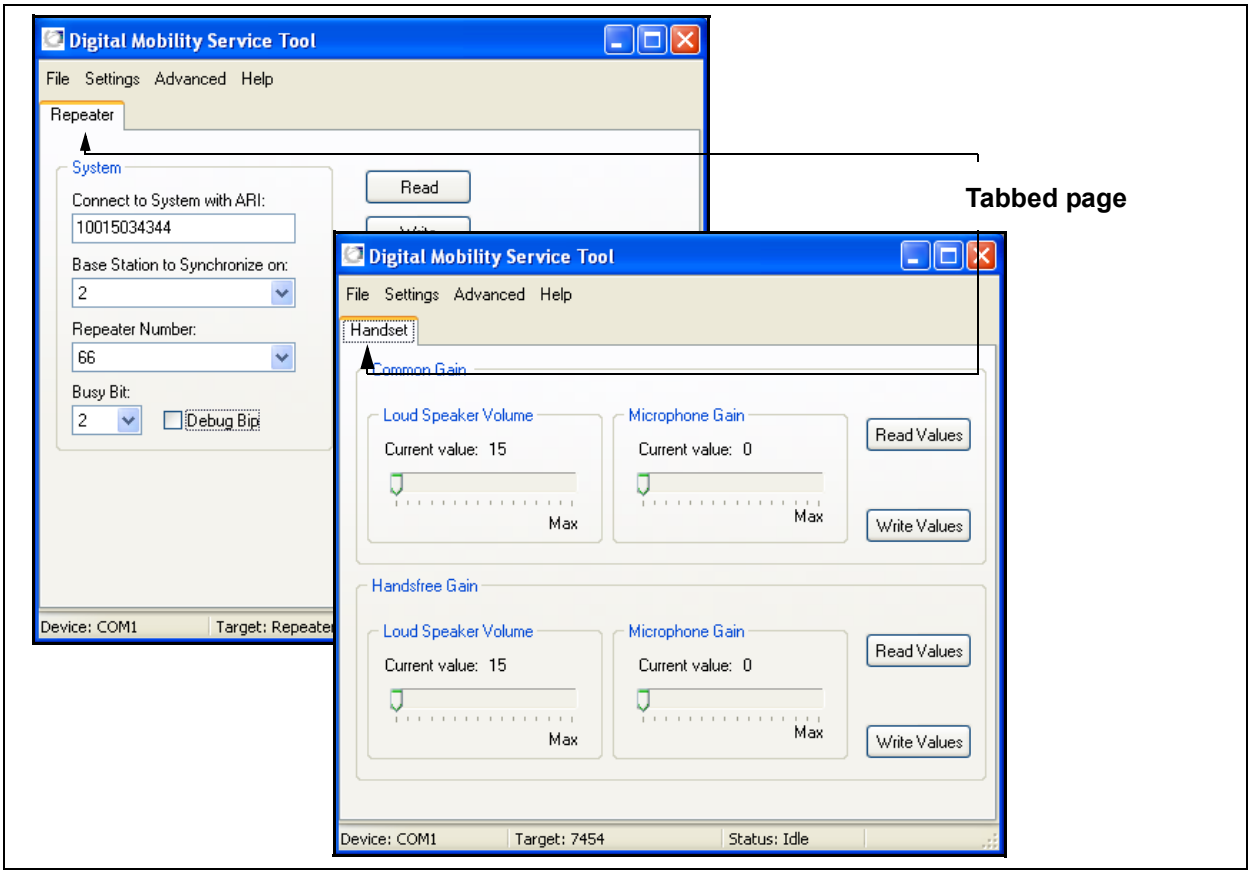


Table 8 Tabbed pages

Tab	Description
Repeater	Programming of repeaters
Handset	Handset adjustments

Description of the Master handset interface

This section provides you with information about the Master handset interface.

The following keys are used when registering handsets via the Master handset:

Key	Description
≣	Menu key for accessing the menu
>	Right arrow key for navigating forward in the menu
<	Left arrow key for navigation back in the menu
✓/ OK	Enter key for accept of menu selection. You will find the **OK** -key on model 7420 and the ✓-key on model 743X, 744X and 745X.

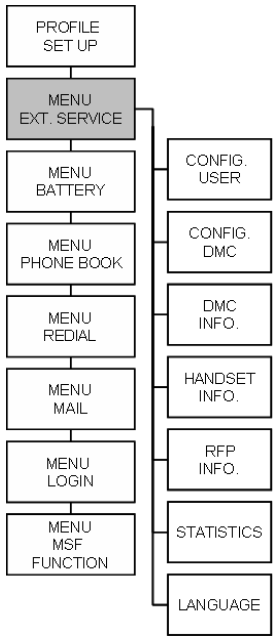
Master handset menu structure

Once a Master handset has been subscribed, it has special rights access to the DMC which is used to configure various settings.

- To access the DMC through the Master handset, press **MENU (≣)**, use the > key to find MENU EXT. (EXTERNAL) SERVICE, then press ✓/**OK**.

  The first layer of the DMC menu structure through the Master handset is shown below:

MENU	Description
Configure user	Add/remove/edit/view handset subscriptions
Configure DMC	For configuring the DMC through the Master handset
DMC information	View system settings
Handset information	View information on all subscribed handsets
Repeater information	View information on repeaters
Statistics	Reads out system statistics summary
Languages	Set languages for the external service menus accessible through the Master handset.



Refer to "Setting up a Master handset (registering and subscribing)" on page 105 for more information about configuring a Master handset.

Language settings for Master handset

For EXT. SERVICE the Master handset can be set up to use one of three languages. The default language is English.

To change the default language follow the steps below:

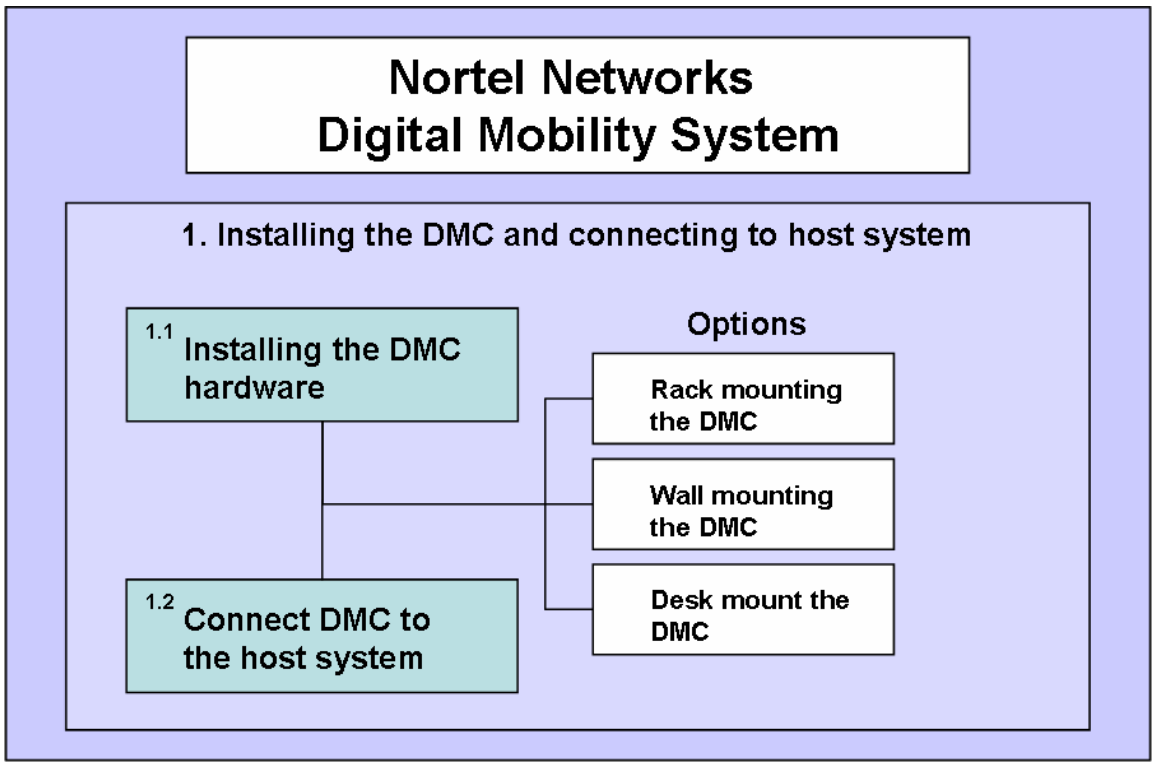
1. Press **MENU (≣)**.
2. Press ✓/**OK** - go to **LANGUAGE**.
3. Press ✓/**OK** and select from:
   - English
   - Spanish
   - French
4. Press ✓/**OK** to confirm language selection.

Chapter 3
DMC installation

This section describes how to install the DMC and connect the DMC to the host system.

You can install the DMC in an equipment rack, on a wall or on a desktop.

Figure 14 Install the DMC and connect to host system


Nortel Networks
Digital Mobility System
1. Installing the DMC and connecting to host system
1.1 Installing the DMC hardware
1.2 Connect DMC to the host system
Options
Rack mounting the DMC
Wall mounting the DMC
Desk mount the DMC

This section contains the following information:

- "System equipment for the DMC" on page 56
- "Install a DMC in an equipment rack" on page 57
- "Install a DMC on the wall" on page 59
- "Install a DMC on a flat surface" on page 62
- "Connecting DMC to host system (TCM loop)" on page 63

System equipment for the DMC

The information in this section provides information about the equipment required to install the DMC. This section contains the following information:

- "Basic hardware" on page 56
- "Optional equipment" on page 56
- "Equipment for installing the DMC" on page 56

Use the checklists in this section to ensure you have all the required equipment.

Basic hardware

Before you install the DMC, ensure you have the correct amount of the following hardware:

- DMC (DMC080 or DMC032)
- One TCM loop available on the host system for each Digital Mobility phone
- Digital Mobility base stations
- Digital Mobility repeaters (optional)
- Digital Mobility phones
- cabling for connections between hardware units

Optional equipment

The following equipment can be ordered separately, depending on your installation requirements:

- Rack mount tray (NT9T6325)
- Wall mount bracket (NT9T6700)
- Rubber feet
- System link cable (NT7B65LS)

Equipment for installing the DMC

To perform the installation of the DMC, you need the following equipment:

- mounting hardware
  (either a rack mounting tray, a wall mount bracket per DMC or four rubber feet per DMC)
- Phillips screwdriver #2
- flat blade screwdriver
- pliers
- antistatic grounding strap
- connecting tool
- surge protector (recommended)
- cables, 25-pair cable with RJ-21 connectors

Install a DMC in an equipment rack

You can install a DMC in the same rack as your other networking and telecommunications equipment.

Note: The DMC and the host system must be within 15 meters of each other.

To rack mount a DMC, you need the optional Rack Mount Kit (NT9T6325). This kit provides the parts you need to mount several DMCs into a standard 19-inch equipment rack.

Use the following procedures to mount the DMC in a rack:

- "Install the rack mount tray in an equipment rack" on page 57
- "Install a DMC on the rack mounting tray" on page 58

Caution: Refer to "Installation prerequisites" on page 44 for acceptable environmental conditions before selecting a location for the DMC.

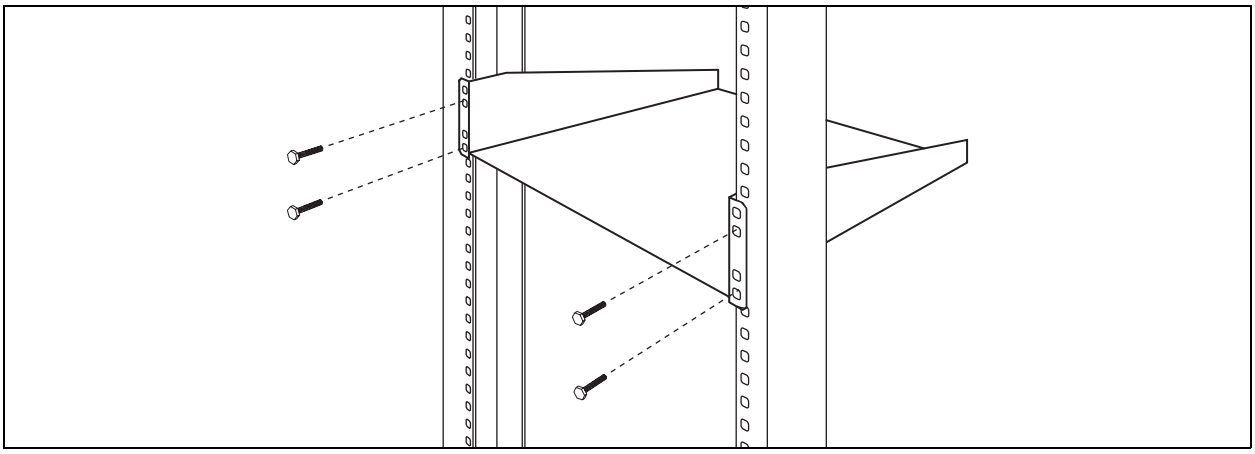
Caution: To keep the DMC operating at optimal internal temperature, keep the bottom, sides and rear clear of obstructions and away from the exhaust of other equipment.

Install the rack mount tray in an equipment rack

Use this procedure to install the rack mount tray in an equipment rack.

1. Determine the location in the rack where you want to install the DMC.
2. Position the rack mounting tray in the rack.
3. Align the holes in the rack mounting bracket with the holes in the equipment rack rails.
4. Fasten the rack mounting brackets to the rack using the four rack screws (supplied).

Figure 15 Fasten the rack mounting tray to an equipment rack



5. This procedure is complete.

Install a DMC on the rack mounting tray

The rack mounting tray has tabs molded into its surface that allow you to clip the DMC to the tray. By clicking the DMCs to these tabs you can prevent the DMC from accidently being knocked off of the rack mounting tray.

If you are installing another DMC in a linked system, you can install the second DMC on the tray beside the first DMC or you can install the second DMC on top of the first DMC.

- "Install a DMC directly on the rack mounting tray" on page 58
- "Install a DMC on another DMC" on page 59

Install a DMC directly on the rack mounting tray

1. Place the DMC on the rack mount tray so that the DMC feet are in the depressions in the tray. Move the module forward so the feet are touching the front side of the depressions.
2. Slide the module back until the DMC feet click in place on the tabs in the depressions.
3. If you want to further secure the DMC, use four of the plastic screws supplied with the rack mount kit to attach the DMC to the rack mount tray.
   To attach the DMC, ensure that the screw holes in the DMC are aligned with the holes in the rack mount tray. Then drive the four screws through the holes in the bottom of the tray and into the screw holes in the bottom of the DMC.

   Caution: Use only the screws supplied with the Rack Mount Kit (NT9T6325). Do not replace the screws. Other screws may damage the module.

4. This procedure is complete.

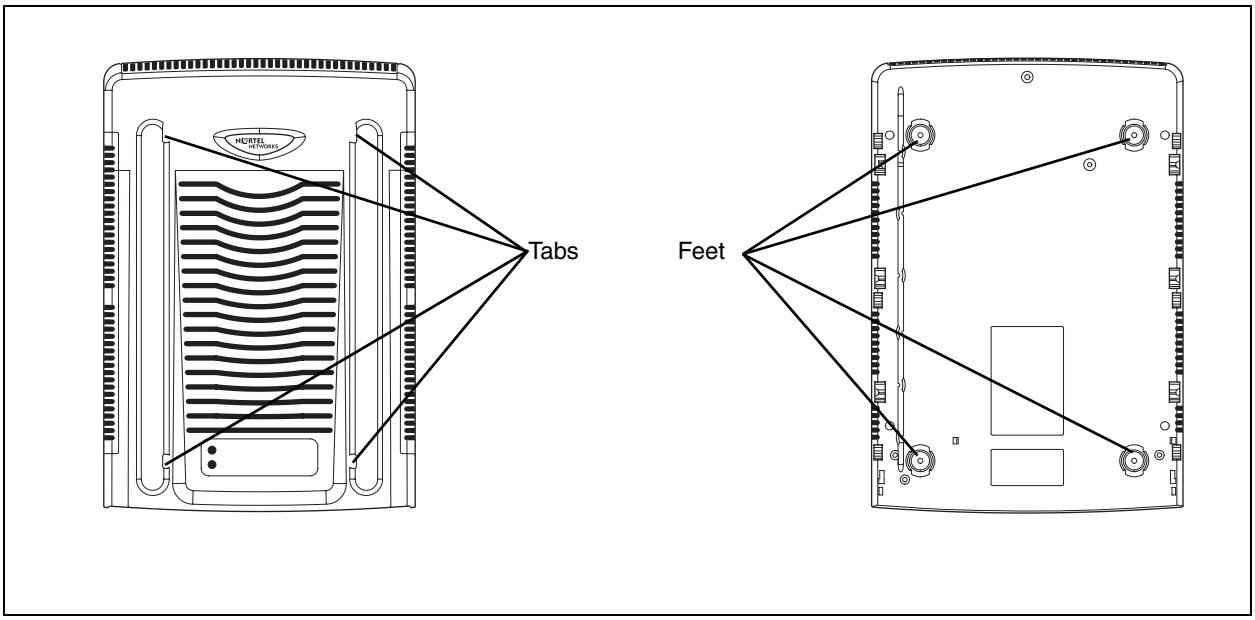
Install a DMC on another DMC

1 Place the DMC on top of the other DMC. Make sure that the DMC feet are in the slots on the top of the DMC, and in front of the tabs.

2 Slide the DMC back until it clicks in place on the tabs. Refer to the figure below.

3 This procedure is complete.

Figure 16 DMC tabs



Install a DMC on the wall

This procedure describes how to mount a DMC on a wall.

To mount a DMC on the wall, you need:

- a Wall Mount Bracket kit (NT9T6700)
- a plywood backboard two cm thick. Consult Local Electrical Code

Caution: Refer to "Installation prerequisites" for acceptable environmental conditions before selecting a location for the DMC.

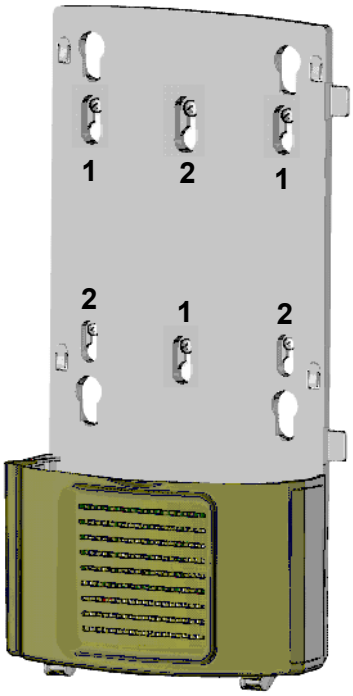
1 Mark the location of the plywood backboard on the wall using a pencil. Use a ruler and bubble-level to check that the plywood backboard is level.

2 Mount the plywood backboard securely to the wall.

3 Place the wall mount bracket on the backboard and use a bubble-level to check that the wall mount bracket is level.

4 Using the wall mount bracket as a template, mark the location of three of the wall mount bracket holes on the plywood backboard. Refer to the following figure.

Figure 17 Wall mount bracket



Note: When using three screws, Nortel Networks recommends installing the screws in the three holes labeled “1” or the three holes labeled “2”.

5 Install three #10 x 2.5 cm round-head wood screws in the backboard.
Do not tighten the screws heads against the backboard. Leave approximately 0.5 cm of the screw exposed from the backboard.

6 Prepare the wall mount bracket by removing the alignment tabs or the side breakouts on the cable management door. The list below describes what to remove for each of the installation scenarios.

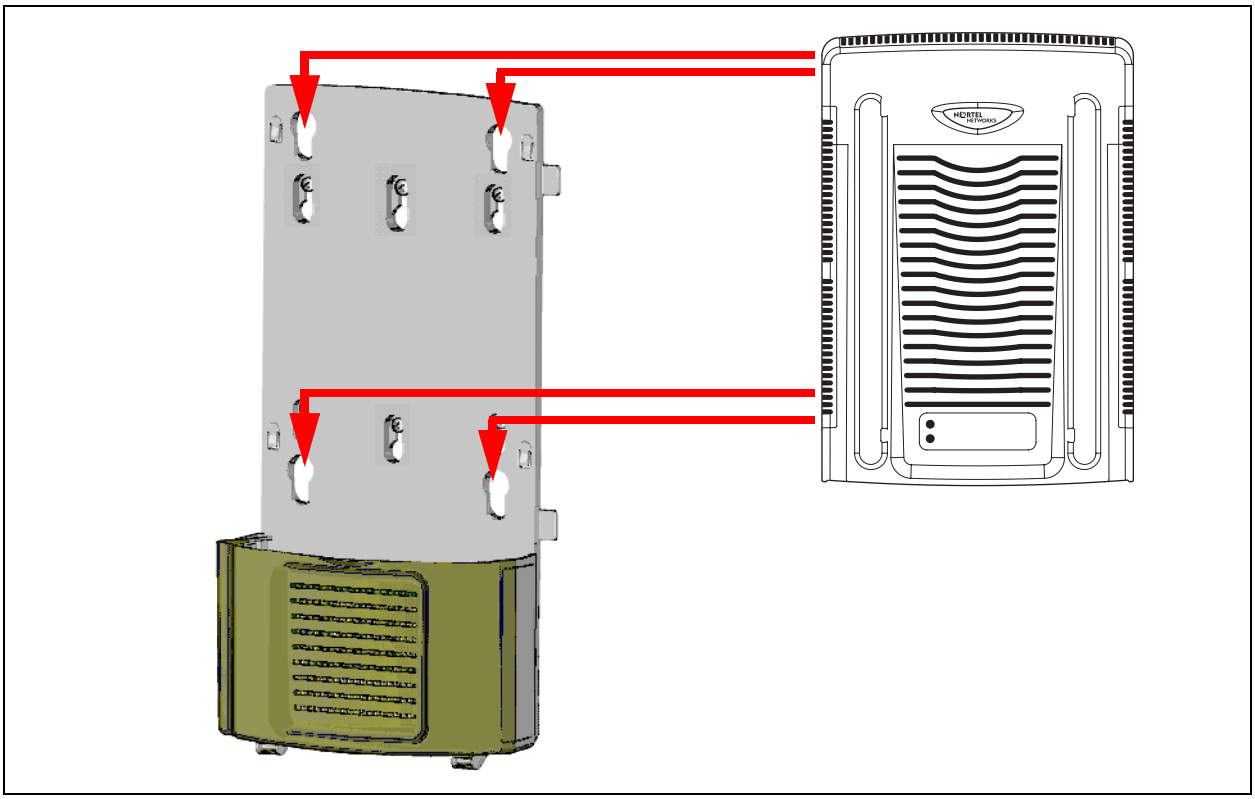
- If this is the only DMC in the system, remove the alignment tabs on the right side of the wall mount bracket.
- If this is the first DMC on a system with two DMCs (a linked system), remove the side breakout from the right side of the cable management door.
- If this is the last DMC on a system with two DMCs (a linked system), remove the alignment tabs and the side breakout from the left side of the cable management door.

7 Hang the wall mount bracket on the mounting screws. Make sure the wall mount bracket is level and the wood screw heads seat fully into the wall mount bracket slots.

8 Tighten the wood screws against the wall mount bracket.

9 Align the feet on the DMC with the four holes in the wall mount bracket. Refer to the following figure.

Figure 18 Attach the DMC to the wall-mount bracket



10 Press the DMC against the wall mount bracket and slide the module down until it clicks in place.

11 Repeat steps 3 and 10 if you are installing a second DMC in a linked system.

12 Secure the power supply for each unit in such a way that it is secure and cannot be accidentally bumped and dislodged.

13 This procedure is complete.

Install a DMC on a flat surface

Use this procedure to install a DMC on any flat surface that can safely support the weight of the modules.

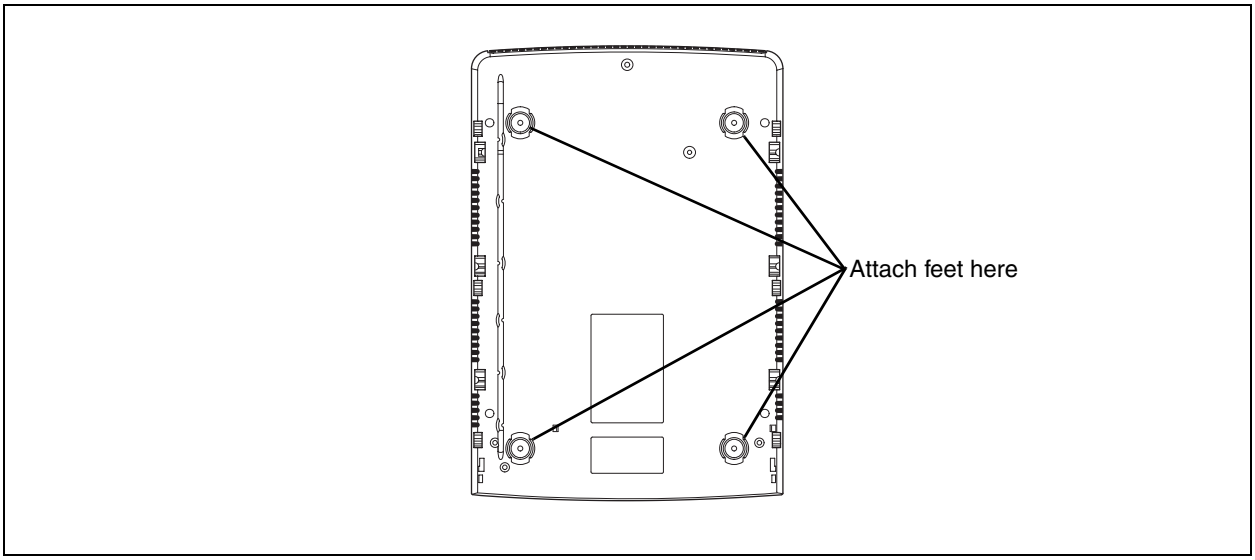
Caution: Refer to "Installation prerequisites" for acceptable environmental conditions before selecting a location for the DMC.

Note: Do not place anything directly on top of the DMC (except for another DMC). The DMC requires the ventilation holes to be free of obstructions to prevent overheating.

To install the DMC on a table or shelf:

1 Attach the four rubber feet to the bottom of the DMC.

Figure 19 Location for feet on bottom of the DMC



2 Position the DMC on the table or shelf. Make sure you leave enough space around the DMC for ventilation and access to the cables.

3 If the DMC is part of a linked system, you can install the other DMC on top of, or beside, the existing DMC.

- To install the second DMC beside the existing DMC, repeat steps 1 and 2.
- To install the second DMC on top of the existing DMC, refer to "Install a DMC on another DMC" on page 59.

4 Secure the power supply for each unit in such a way that it is secure and cannot be accidentally bumped and dislodged.

5 This procedure is complete.

Connecting DMC to host system (TCM loop)

This section describes how to connect the DMC to the host system through TCM loop connections.

TCM Loop connections

The TCM loop connector is a 50-pin amphenol connector with eight TCM loops for the DMC080 and 16 TCM loops for the DMC320. The DMC320 has two TCM connectors which support a total of 32 TCM loops. Refer to "Description of connectors and their placement" on page 33.

Note: The maximum length of TCM loops is 15 meters.

TCM input connector pinout

Below you will find a list of TCM input connector pinouts.

Table 9 TMC input connector pinout

DMC320 Connector 1		**DMC320 Connector 2**	
TCM Loop	PIN	TCM Loop	PIN
1	1 and 26	17	1 and 26
2	2 and 27	18	2 and 27
3	3 and 28	19	3 and 28
4	4 and 29	20	4 and 29
5	5 and 30	21	5 and 30
6	6 and 31	22	6 and 31
7	7 and 32	23	7 and 32
8	8 and 33	24	8 and 33
9	9 and 34	25	9 and 34
10	10 and 35	26	10 and 35
11	11 and 36	27	11 and 36
12	12 and 37	28	12 and 37
13	13 and 38	29	13 and 38
14	14 and 39	30	14 and 39
15	15 and 40	31	15 and 40
16	16 and 41	32	16 and 41

DMC080 Connector 1	
TCM Loop	PIN
1	1 and 26
2	2 and 27
3	3 and 28
4	4 and 29
5	5 and 30
6	6 and 31
7	7 and 32
8	8 and 33

Refer to "Description of connectors and their placement" on page 33 for more information on the placement of connectors.

Next steps

To install base stations, go to Chapter 4.

To install repeaters, go to Chapter 5.

To prepare handsets, go to Chapter 6.

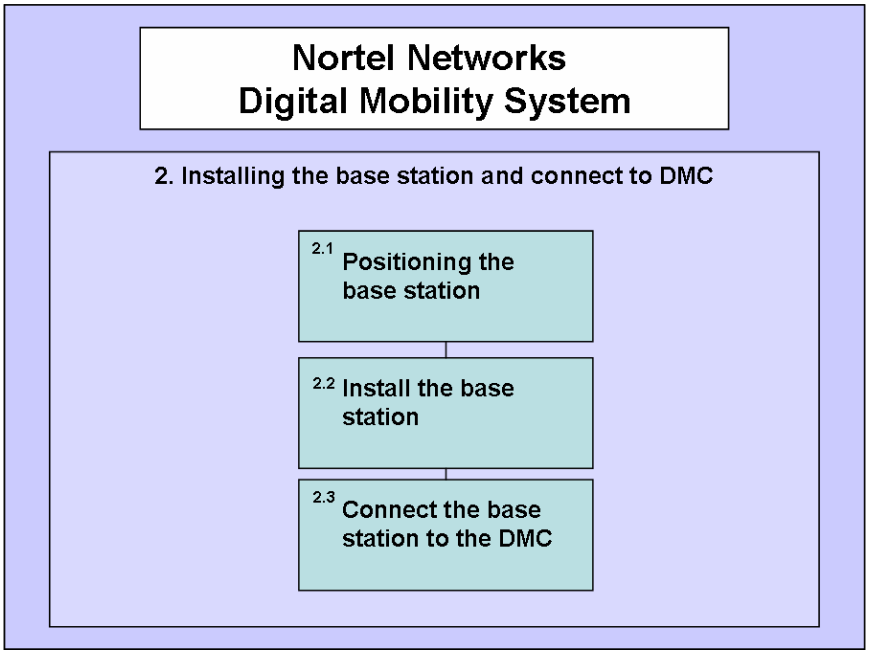
To configure the DMC, go to Chapter 7.

To register and subscribe handsets, go to Chapter 8.

Chapter 4
Base station installation

This section describes the process for installing base stations.

Figure 20 Install the base station and connect to DMC


Nortel Networks
Digital Mobility System
2. Installing the base station and connect to DMC
2.1 Positioning the base station
2.2 Install the base station
2.3 Connect the base station to the DMC

Before you install portable equipment, ensure that a site planner defines the base station locations and records the base station information in the host system programming record.

This section includes the detailed information about:

- "Positioning a base station" on page 66
- "Installing the base stations" on page 66

Caution: You must install all base stations within 1500 meters of the DMC. Always make a cable delay measurement to ensure seamless handover between base stations. Refer to "Configuring the DMC through DMC OAM program" on page 94 or "Configuring the DMC through the Master handset" on page 98 for more information about cable delay measurement.

Positioning a base station

Avoid installing base stations on large concrete or marble columns because these columns affect radio coverage. If possible, place the base station a minimum of one meter from these types of columns. Do not install a base station with the antenna housings near metal objects. Be careful not to damage existing wiring or panels.

Do not position base stations in ducts, plenums, or hollow spaces used to transport environmental air except where the duct, plenum or hollow space is created by a suspended ceiling having lay-in panels.

To expand a coverage area with base stations, additional base stations must be placed in such a way that overlap between the base stations radio coverage is established. It is recommended that the overlap is at least 10 to 15 meters.

Note: Radio coverage depends on material and construction of buildings and surroundings.

Warning: Never install base stations in rows.

Installing the base stations

Install base stations on a wall.

Note: The base station must be placed in the right position. If the base station is placed upside-down, the coverage area of the base station is decreased by 40 - 50%.

Note: Before beginning the installation, it is important to determine the location of the base station for the best coverage. The coverage depends on the construction of the building, architecture and choice of building materials. Refer to “Environmental checklist” on page 41 for more information on environmental requirements for base stations.

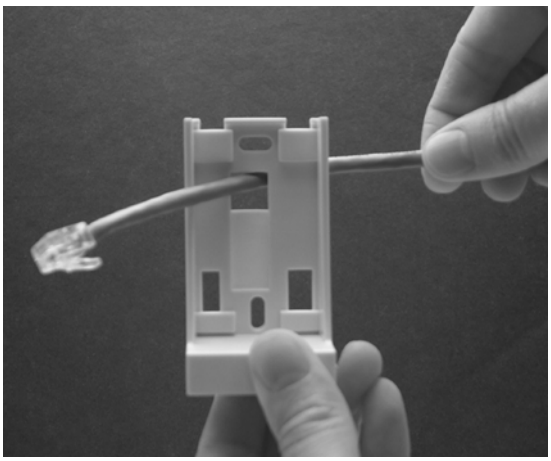
This section provides information about:

- “Installing a base station” on page 67
- “Wiring the base station” on page 69

Installing a base station

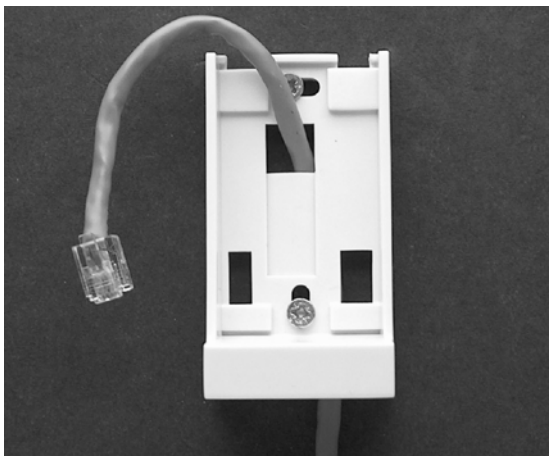
1 Use a twisted pair wire, e.g. Cat. 4, between the DMC and the base station with a RJ11 connector at the base station end of the wire. Connect the wire to the plug using the two inner connectors of the plug. Pull the wire through the wall bracket.

Figure 21 Pull wire through the wall bracket



2 Mount the wall bracket on the wall using the screws accompanying the base station.

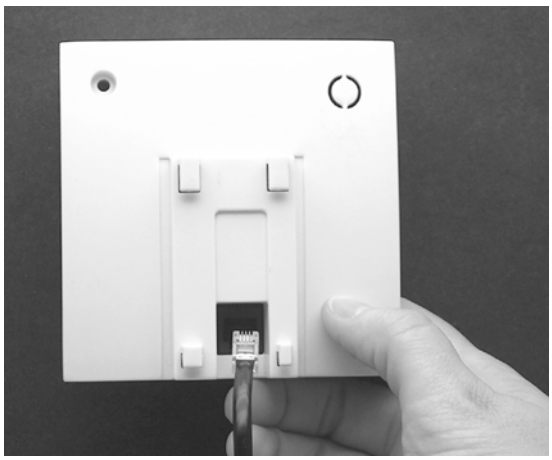
Figure 22 Mount the wall bracket



Note: Do not fasten the screws completely to allow for adjustments of the wire length when connecting the wire to the base station.

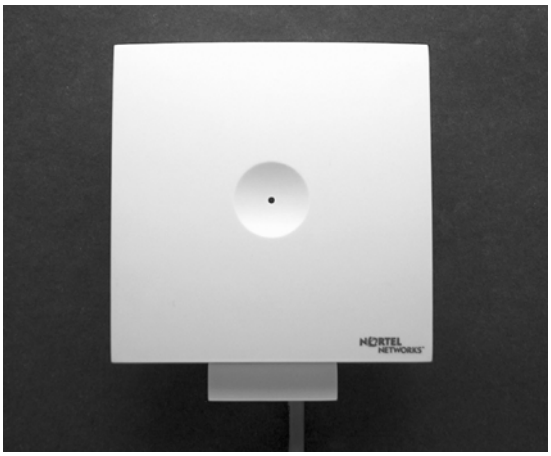
3 Connect the plug on the rear of the base station. Adjust the length of the wire, and then fasten the wall bracket.

Figure 23 Connect the plug to the rear of the base station



4 Click the base station to the wall bracket.

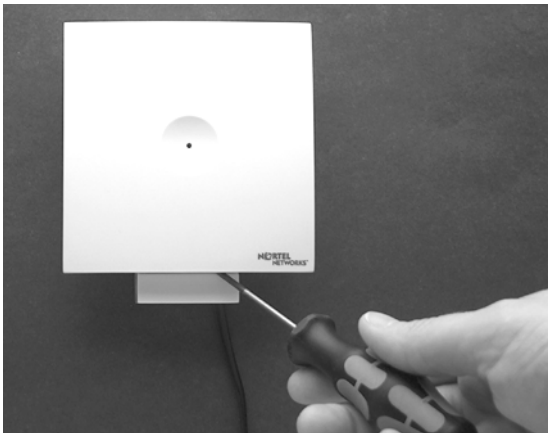
Figure 24 Base station attached to wall bracket



5 Connect the base station to the DMC. Refer to "Wiring the base station" on page 69 for more information.

Note: If you need to remove the base station, separate it from the wall bracket with a gentle push of a screwdriver inserted between the wall bracket and the base station.

Figure 25 Opening the base station housing



Wiring the base station

This section describes how to wire the base station to the DMC.

1. Install the wires from the base stations to the DMC.
2. Connect the base station wires to the RJ45 connector for the DMC. For placement of the individual base station wires in the connector, see figures and table below.

Figure 26 RJ45 connection for DMC

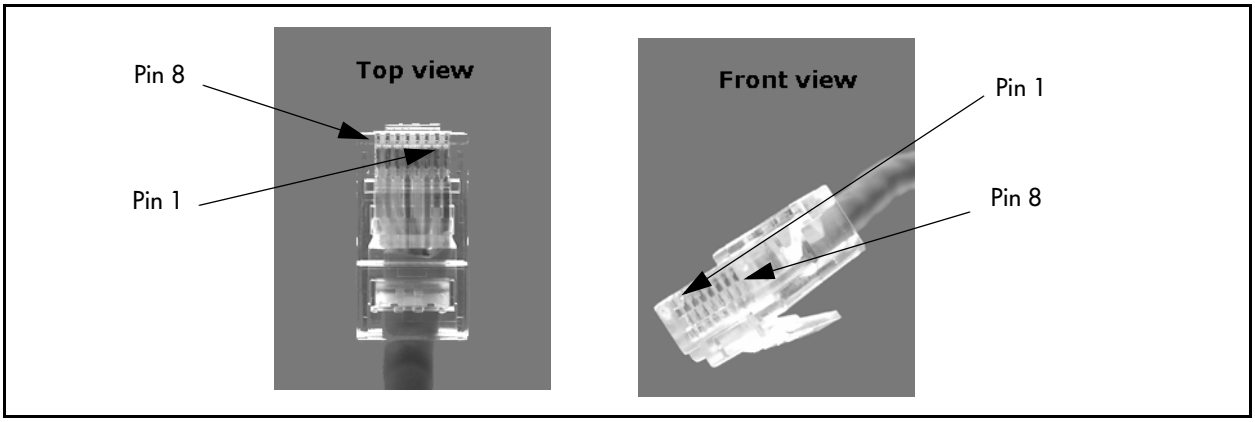


Table 10 DMC - RJ45 connection diagram

DMC080	
RJ45 Connector	
Base station	**Pin**
1	4 - 5
2	1 - 2
DMC320	
RJ45 Connector 1	
Base station	**Pin**
1	4 - 5
2	1 - 2
3	3 - 6
4	7 - 8
RJ45 Connector 2	
5	4 - 5
6	1 - 2
7	3 - 6
8	7 - 8

3 Insert the RJ45 connector in the base station connection(s) of the DMC. Refer to "Description of connectors and their placement" on page 33.

Note: After wiring the base station the first time, you must measure the cable delay in order to synchronize the base station. The synchronization ensures seamless handovers. For more information about measuring cable delay, refer to "Configuring the DMC through DMC OAM program" on page 94 or "Configuring the DMC through the Master handset" on page 98.

Next step

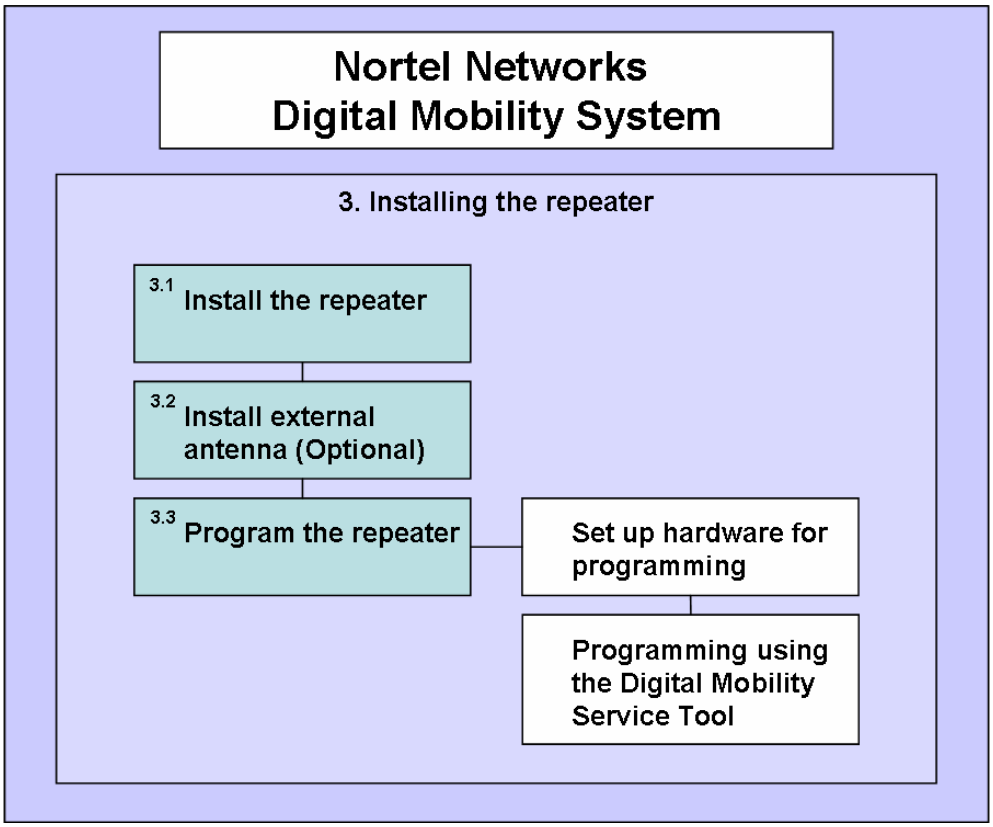
If repeaters are required, go to Chapter 5 (Repeater installation).

If no repeaters are required, go to either Chapter 7 (Configuring the DMC) or Chapter 6 (Preparing handset for use).

Chapter 5
Repeater installation

This section describes the process of installing repeaters. Installing repeaters requires a software installation as well as a hardware installation.

Figure 27 Install the repeater


Nortel Networks
Digital Mobility System
3. Installing the repeater
3.1 Install the repeater
3.2 Install external antenna (Optional)
3.3 Program the repeater
Set up hardware for programming
Programming using the Digital Mobility Service Tool

This section provides information about:

- “Installing the repeater” on page 72
- “Installing external antennas” on page 74
- “Programming a repeater with the programming kit” on page 77

Note: Before beginning the installation, determine the position of the repeater for best coverage. The coverage depends on the construction of the building, architecture, and the choice of building materials. Refer to “Environmental checklist” on page 41 for more information about environmental requirements for repeaters.

Note: Use only the approved power supply provided with the Repeater unit. Do not make any substitutions.

Note: The repeater does not add channels, it only adds additional coverage area.

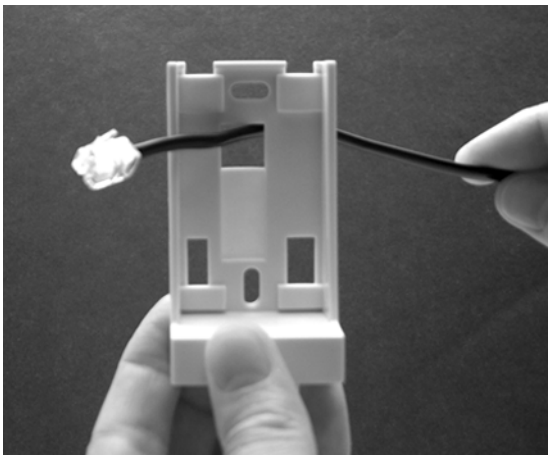
Note: The repeater can only be registered on the system when placed within the coverage area of a base station or within the coverage area of an already-installed repeater.

Note: A half slot repeater covers two simultaneous speech channels. A full slot repeater covers four simultaneous speech channels. These channels are borrowed from the attached base stations, and are not additional channels to the total number of channels on the system.

Installing the repeater

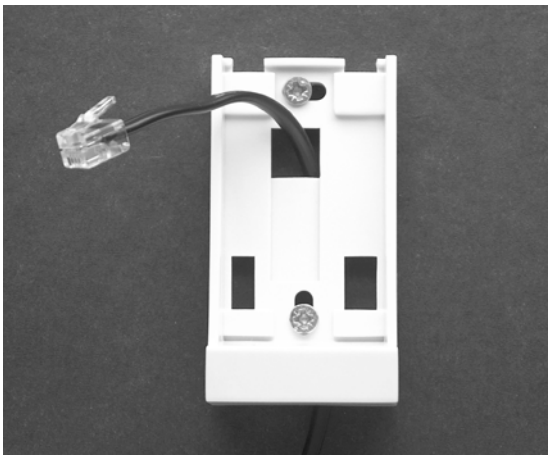
1 Pull the wire from the power supply (mains) through the wall bracket.

Figure 28 Pull power supply connector and wire through the wall bracket



2 Mount the wall bracket on the wall using the screws accompanying the repeater.

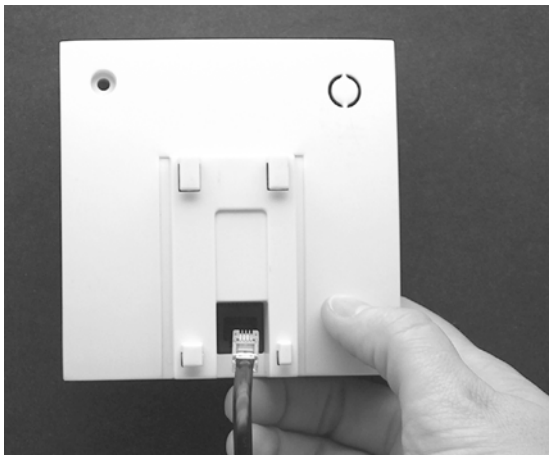
Figure 29 Mount wall bracket for repeater



Note: Do not fasten the screws completely to allow for adjustments of the wire length when connecting the wire to the repeater.

3 Connect the power supply plug on the rear of the repeater. Adjust the length of the wire, and then fasten the wall bracket.

Figure 30 Connect power to rear of repeater

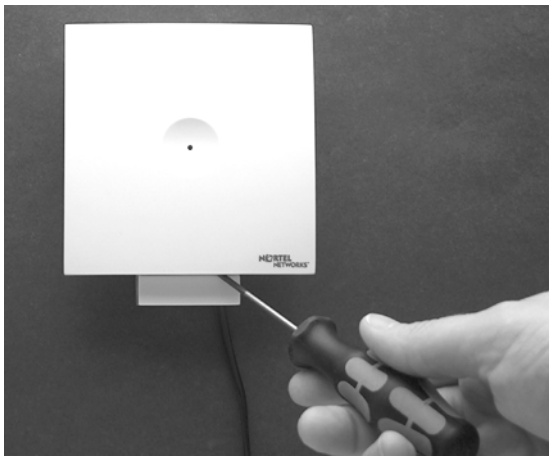


4 Click the repeater on the wall bracket.

Figure 31 Repeater installed on wall bracket

Note: If you need to remove the repeater, please separate it from the wall bracket with a gentle push of a screwdriver inserted between the wall bracket and the repeater.

Figure 32 Opening the Repeater housing



Installing external antennas

The repeater can be fitted with an external antenna to increase the coverage area further. Professional installation is required for the external antenna. Refer to "Digital Mobility Repeater (WRFP)" on page 30 for an illustration of a repeater with external antenna.

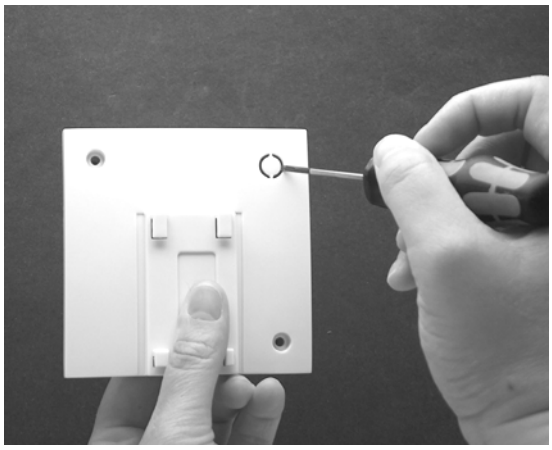
Note: The external antenna used for the transmitter is to be fixed-mounted on indoor permanent structures providing a separation distance of at least 20 cm from all persons during normal operation and must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: The external antenna can be placed max. one meter from the repeater and must be placed in the direction of the base station that the repeater should synchronize with. If the external antenna and repeater is part of a repeater jump, the antenna should be directed towards the repeater to be synchronized with.

The external antenna comes with a wall mounting holder into which the external antenna can be clipped on to the main unit.

1 To connect the external antenna to the repeater, break off the tab covering the antenna connection at the rear of the repeater.

Figure 33 Remove tab on Repeater housing



2 Mount the wall bracket for the external antenna on the wall using the accompanying 30mm screws.

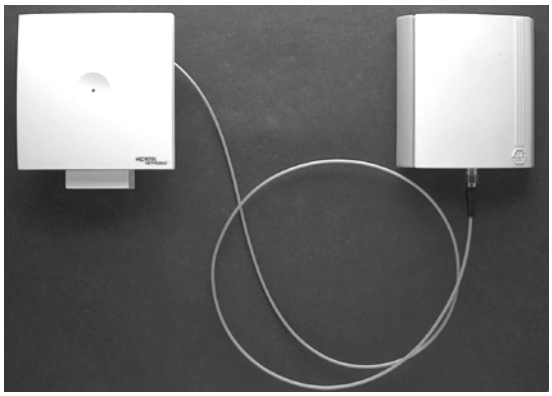
Figure 34 External antenna wall bracket

3 Clip the antenna into position.

Figure 35 Antenna housing attached to wall bracket

4 Connect the antenna cable at the rear of the repeater with the connection plug at the bottom of the external antenna.

Figure 36 External antenna cable connected to Repeater housing



Note: If you need to remove the external antenna, unclick the antenna from the wall bracket with a gentle pull.

Programming a repeater with the programming kit

This section provides information about:

- "Content of the programming kit:" on page 77
- "Set up of the hardware for repeater programming:" on page 77
- "Programming the repeater with the Digital Mobility Service Tool" on page 78

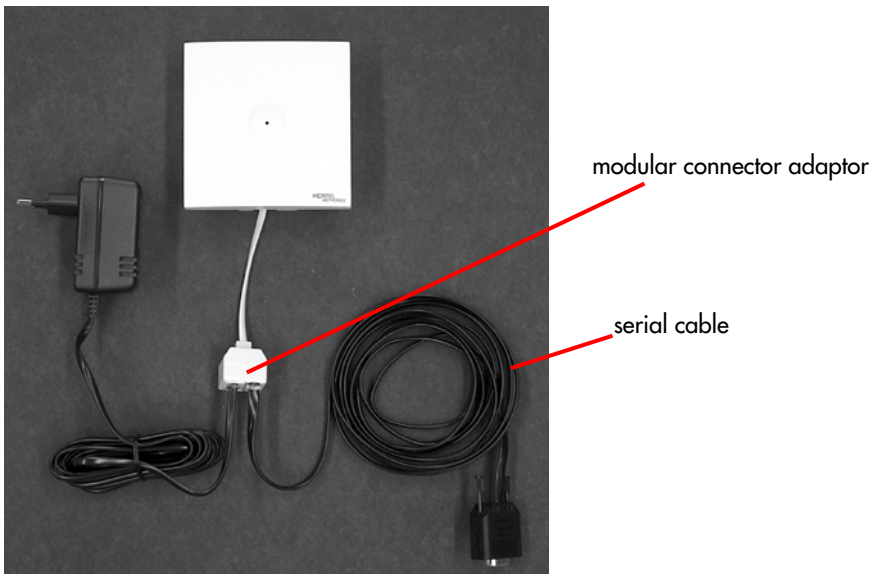
Content of the programming kit:

The programming kit (NT7B65LK) consists of:

- modular connector adaptor
- serial cable

Note: For programming the repeater you also need the programming software (Digital Mobility Service Tool). The Digital Mobility Service Tool is not part of the programming kit but can be found on the host system CD (Norstar systems) or under the Client Install button on the Business Communications Manager Unified Manager application.

Figure 37 Repeater programming kit



Set up of the hardware for repeater programming:

1. Unplug the repeater power cable and insert the modular connector adaptor.
2. Connect the repeater power cable to the modular connector adaptor and the mains.

   Note: Ensure that you have the appropriate power supply for the local requirements.

3 Connect the serial cable to the modular connector adaptor and Com port of your computer.

The repeater is now ready for programming via the Digital Mobility Service Tool.

Programming the repeater with the Digital Mobility Service Tool

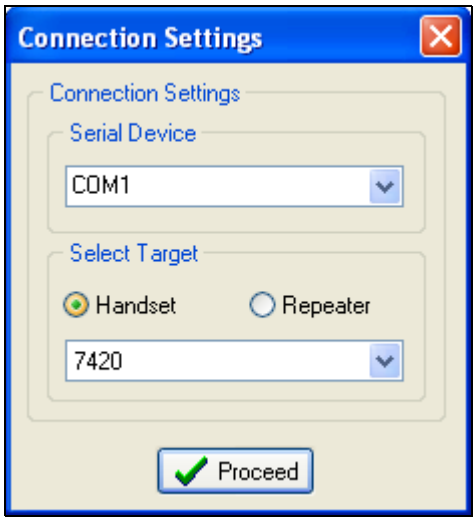
The Digital Mobility Service Tool is the tool you access from your desktop and use for repeater programming, handset adjustment and software download to the handset and repeater. For a detailed explanation of the Digital Mobility Service Tool, refer to "Description of the Digital Mobility Service Tool" on page 51.

1 Before you start programming the repeater, ensure that the repeater is connected to the computer and the mains. Refer to "Set up of the hardware for repeater programming:" on page 77.

2 Open the Digital Mobility Service Tool on your desktop.

A **Digital Mobility Service Tool** window appears.

Figure 38 Connect to the Digital Mobility Service Tool



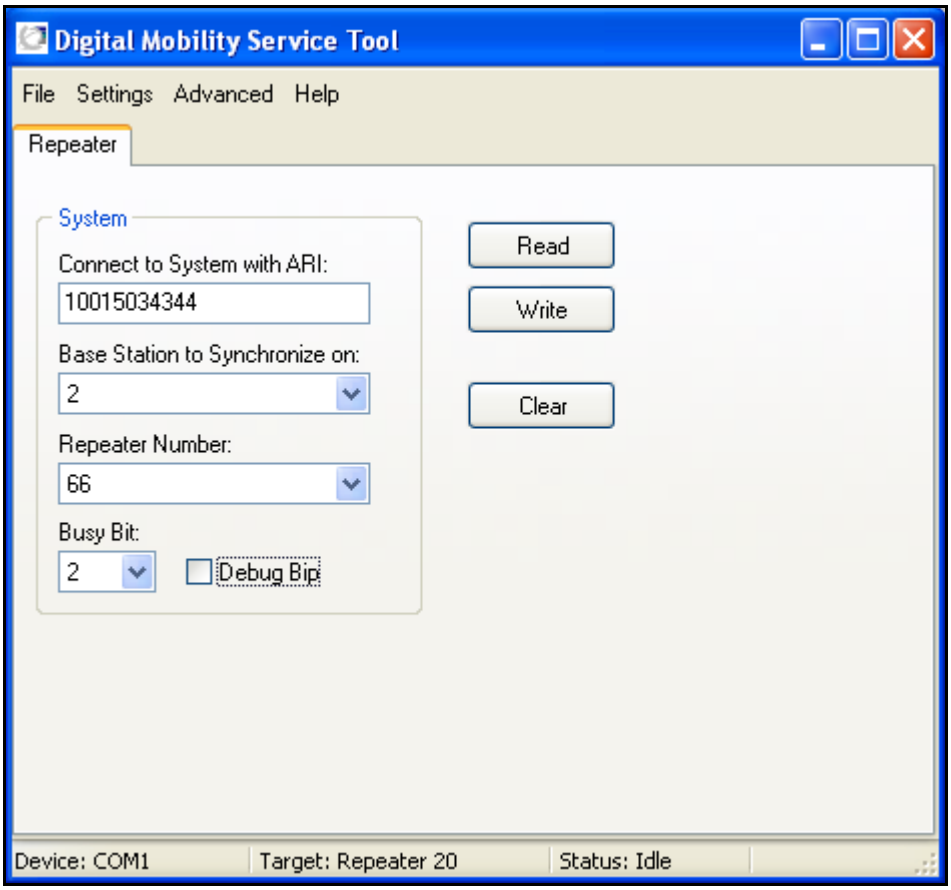
3 Select a Com port from the **Serial Device** list.

4 Click **Repeater,** and then select the wanted repeater model from the list.

5 Click **Proceed**.

The Repeater configuration screen displays.

Figure 39 Digital Mobility Service Tool, Repeater tab



A message displays in the status bar when repeater is connected.

6 In the **Connect to System with ARI** field, type the DMC ARI code.

The ARI code is an 11-digit serial number for the DMC. The number is located on the label on the rear of the DMC.

Refer to "Installation prerequisites" on page 44.

7 In the **Base to synchronize on** field, select the number of the base station which the repeater must synchronize with.

Refer to "Installation prerequisites" on page 44.

8 In the **Repeater number** field, select the assigned number of the repeater

The numbering of the base station and repeaters (both half slot and full slot) has to follow the numbering shown in the tables below.

Table 11 Repeat numbering table

Base station	Repeater 1	Repeater 2	Repeater 3
0	64	128	192
1	65	129	193
2	66	130	194
3	67	131	195
4	68	132	196
5	69	133	197
6	70	134	198
7	71	135	199
8	72	136	200
9	73	137	201
10	74	138	202
11	75	139	203
12	76	140	204
13	77	141	205
14	78	142	206
15	79	143	207

Note: Repeater and base station numbers must not be the same. Neither can the repeater have a number similar to another base station or another repeater in a situation where common overlap is present between the actual units. If this occurs, handover between the different units is not possible.

Refer to "Installation prerequisites" on page 44.

Table 12 Example of a normal base station/repeater configuration

Numbering of base station and repeaters in a normal configuration	
First repeater	No. of base station + 64 Base to synchronize on: Number of base station
Second repeater	No. of base station + 128 Base to synchronize on: Number of base station
Third repeater	No. of base station + 192 Base to synchronize on: Number of base station

Table 13 Example of repeater jump configuration

Numbering of repeaters in a repeater jump configuration	
First repeater in chain	No. of base station + 64 Base to synchronize on: Number of base station
Second repeater in chain	No. of base station + 128 Base to synchronize on: Number of previous repeater
Third repeater in chain	No. of base station + 192 Base to synchronize on: Number of previous repeater

9 In the **Busy Bit** list, select a value between 0 and 3.

By setting busy bit it is possible to control when the repeater will transmit a busy signal to the handsets:

0: No busy bit transmitted

1: Busy bit transmitted when one handset is off hook ( ) or in a feature.

2: Busy bit transmitted when two handsets are off hook ( ) or in a feature.

3: Busy bit transmitted when three handsets are off hook ( ) or in a feature.

Note: Busy bit is set to default 2, i.e. there is one channel left for making handover. It is recommend to use the default setting =2. The setting 2 means that the repeater can support two off-hook handsets simultaneously, and there is still one channel available for communication between repeater and base station and one channel available for handover events.

For more detailed information about half slot repeaters and full slot repeaters, refer to "Digital Mobility Repeater (WRFP)" on page 30.

10 Optionally, you can select the **Debug Bip** check box.

Selecting the **Debug Bip** check box is useful for error findings on the system. When selecting the **Debug Bip** check box, the handset bips when it logs on the repeater. When the handset is off hook and connected to the repeater, you will hear a bip every three seconds in the handset.

Note: Under normal circumstances it is recommended that the **Debug Bip** check box is not selected.

11 Click **Write** to confirm the settings and program the repeater.

12 Click **Read** to check that the settings are as required.

13 To program another repeater:

- Select the **Connection Settings** command from the **Settings** menu.
- Select a repeater from the list in the appearing **Connection Settings** dialog box, and then repeat steps 6 to 12.

14 On the **File** menu, click **Exit**.

The repeater has now been programmed.

Downloading firmware

In the event of new software releases it is possible to download new versions of the repeater software. Refer to “Download Flash” on page 153 for information on firmware downloads to the repeater.

Next step

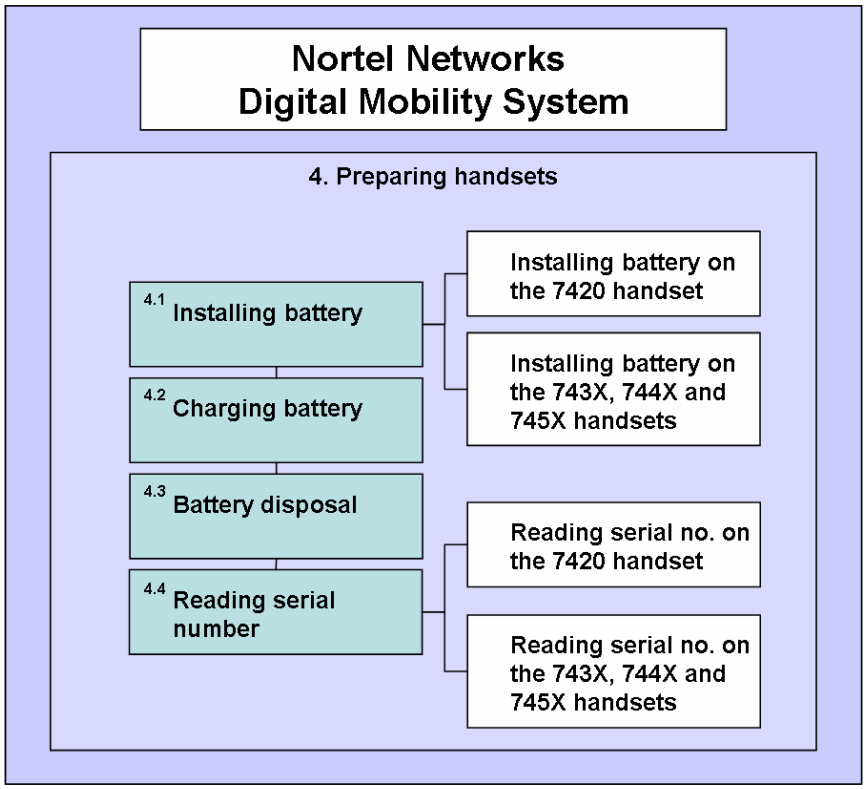
To prepare handsets, go to Chapter 6.

To configure the DMC, go to Chapter 7.

Chapter 6
Preparing handset for use

This section provides general safety information about handset and battery, information on how to install and charge the battery and how to read the serial numbers on the different handsets. It also contains a short description of the handset and handset keys.

Figure 40 Prepare handsets


Nortel Networks
Digital Mobility System
4. Preparing handsets
4.1 Installing battery
4.2 Charging battery
4.3 Battery disposal
4.4 Reading serial number
Installing battery on the 7420 handset
Installing battery on the 743X, 744X and 745X handsets
Reading serial no. on the 7420 handset
Reading serial no. on the 743X, 744X and 745X handsets

This section provides information about:

- "Handset information" on page 84
- "Battery information" on page 84
- "Installing battery on 7420 handsets" on page 85
- "Installing battery on 743X, 744X, and 745X handsets" on page 86
- "Charging battery" on page 87
- "Battery disposal" on page 87
- "Reading serial number" on page 88

Handset information

Read the following information before you use the handset.

Ensure that the adapter voltage is the same as the electrical outlet voltage. The 74XX handset uses radio signals and does not guarantee a connection in all circumstances. Do not rely on a cordless handset to make emergency calls.

Never use your handset:

- in the vicinity of electrical detonators
- in shielded rooms
- in areas where radio transmission is forbidden
- in aircraft

Do not place a handset near:

- water, moisture or damp areas
- heat sources, direct sunlight or unventilated areas
- devices which generate strong magnetic fields such as electrical appliances, fluorescent lamps, computers, radios, televisions or fax machines
- areas where the handset can be covered, its ventilation impaired, liquid spilled on the unit or objects inserted into the handset through any openings.
- areas with dust, vibration, shock or temperature extremes

Check for small metal objects in the handset earpiece/mouthpiece before using the handset.

Do not store or locate flammable liquids, gases, or explosive materials in the same compartment or vicinity as the cordless handset, its parts or accessories.

Battery information

Read the following information before you handle the batteries:

- Do not replace the batteries in potentially explosive environments, such as rooms where flammable liquids or gases are present.
- The battery will explode if disposed of in a fire.
- Do not charge the batteries unless you use the Nortel Networks approved charger and the proper batteries.
- Only use battery type NT7B65LD in the 74XX handset. Do not use these batteries with other products. These batteries were designed specifically for use with the 74XX handset and the 74XX charger ONLY. Improper use of the batteries may result in fire hazard.
- Do not do anything that would cause the battery to short circuit.

Do not let the battery or the charger come into contact with conductive metal objects.

Installing battery on 7420 handsets

Note: The battery is connected to the handset when it is shipped from the factory.

1 To change the battery press down the back cover and push it 5 mm towards the headset plug.

Figure 41 Remove back cover from handset

2 Lift off back cover.

3 Place the battery plug in the slot in the battery box.

Figure 42 Battery positioning in the handset

4 Insert battery with the label readable.

5 Replace the back cover.

Installing battery on 743X, 744X, and 745X handsets

Note: The battery is connected to the handset when it is shipped from the factory.

1 To change the battery unscrew the plate on the rear of the handset to access the battery compartment. Use a normal screw driver.

2 Insert the screwdriver into the small crack behind the blind cover and break to open the handset.

Figure 43 Remove back cover from handset with screw fastener

3 Place the battery plug in the slot in the battery box.

Figure 44 Battery positioning in the handset

4 Insert battery with the label readable.

5 Replace the back cover.

Charging battery

When charging the battery for the first time, it is necessary to leave the handset in the charger for 14 - 16 hours before the battery is fully charged and the handset ready for use.

Note: During normal operation, it takes approximately 3.5 hours to charge the handset from fully discharged to its full capacity.

- Place the handset in the charger.

  For correct charging, be sure the room temperature is between 0°C and 25°C. Do not place the handset in direct sunlight. The battery has a built-in heat sensor which will stop charging if the battery temperature is too high.

  If the handset is turned off when placed in charger, only the LED indicates the charging. When handset is turned off, the LED flashes at a low frequency while charging and lights constantly when the charging is finished. There will be no reaction for incoming calls.

  If the handset is turned on when charging, the display shows the charging status. The display goes back to normal mode when fully charged. It will not vibrate. Auto-answer is inactive. The handset reacts normally for incoming calls.

It is necessary to recharge the battery when the display shows **BATTERY LOW**, or if the handset cannot be turned on. When the battery is fully discharged, up to 10 minutes may pass before charging begins (display lights up). When the charger begins the charging, status is shown on the display if the handset is turned on.

Battery disposal

Warning: Nickel metal hydride batteries must be disposed of in the correct manner. Do not dispose of the batteries in office or household waste.

Nickel metal hydride batteries are recyclable. You can help preserve the environment by returning your unwanted batteries to your nearest recycling center for recycling or proper disposal.

Contact your system administrator for more information about battery disposal and recycling centers in your local area.

Reading serial number

The serial number of the handset can be found either on the label behind the battery or by pressing *99984*✓/**OK** on the handset to be registered. Pressing *99984*✓/**OK** on the handset the serial number is shown in the display.

Reading serial number on 7420 handsets

1 Press down the back cover and push it 5 mm towards the headset plug.

Figure 45 Remove back cover from handset

2 Lift off back cover.

3 Lift the battery and read the serial number.

Figure 46 Serial number location under battery

4 Replace battery and back cover.

Reading serial number on 743X, 744X, and 745X handsets

1 Use a screwdriver to unscrew the plate on the rear of the handset to access the battery compartment.

2 Insert the screwdriver into the small crack behind the blind cover and press to open the handset.

Figure 47 Remove back cover from handset with screw fastener

3 Lift the battery and read the serial number.

4 Replace battery and back cover.

Note: Alternatively, you can also press *99984*✓/**OK** on the handset to be registered. The serial number is now shown in the display.

Next step

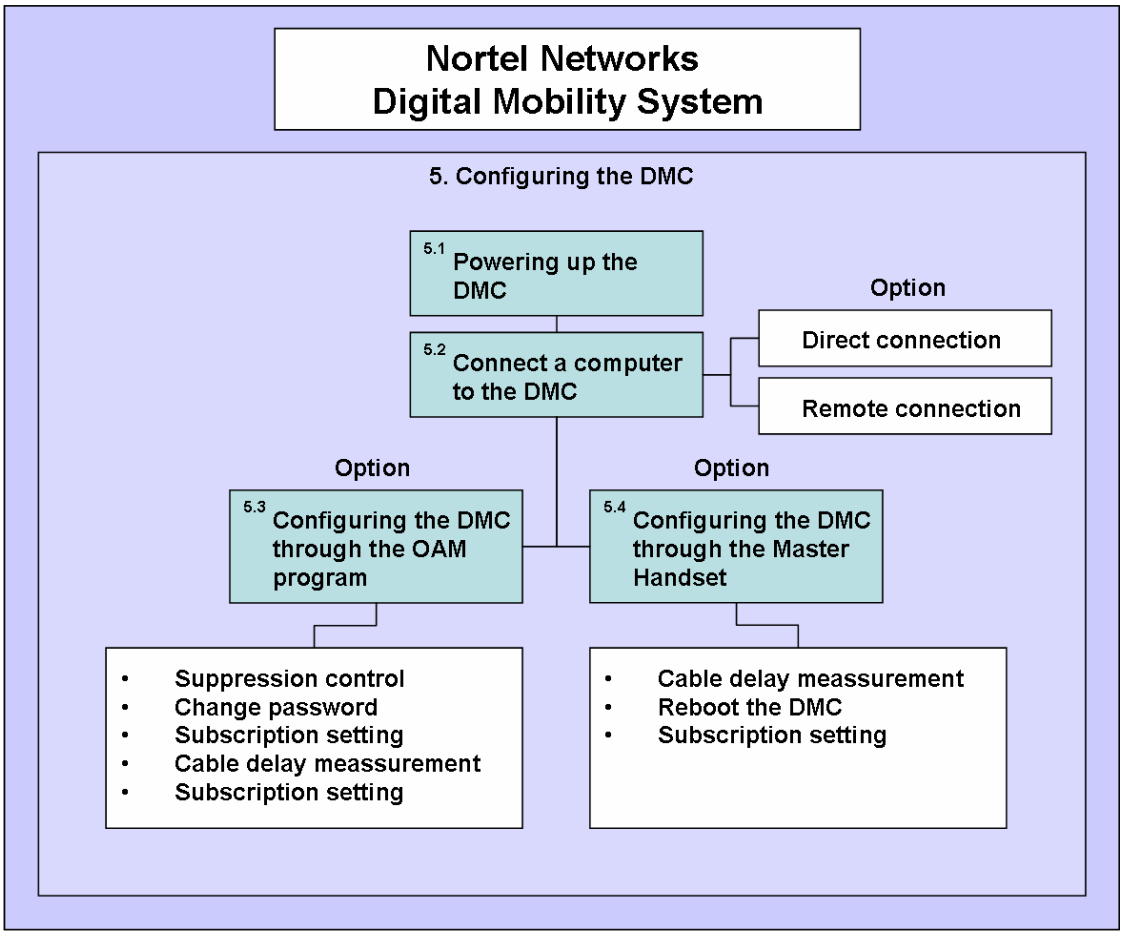
To configure the DMC, go to Chapter 7.

To register and subscribe handsets, go to Chapter 8.

Chapter 7
Configuring the DMC

This section provides you with information on how to power up the DMC, connect a computer to the DMC and how to configure the DMC through the DMC OAM Program and the Master handset.

Figure 48 Configure the DMC



This section includes information about:

- "Powering up the DMC" on page 92
- "Connecting a computer to the DMC" on page 92
- "Configuring the DMC through DMC OAM program" on page 94
- "Configuring the DMC through the Master handset" on page 98

Powering up the DMC

After installing the DMC you need to power up the DMC:

1. Insert the adapter accompanying the DMC in the power supply of the DMC. Refer to "Description of connectors and their placement" on page 33.
2. Connect the adapter to the main power source.
3. The DMC is now powered up and you can connect a computer to the DMC.

Connecting a computer to the DMC

To use the DMC OAM program you need to connect a computer to the DMC.

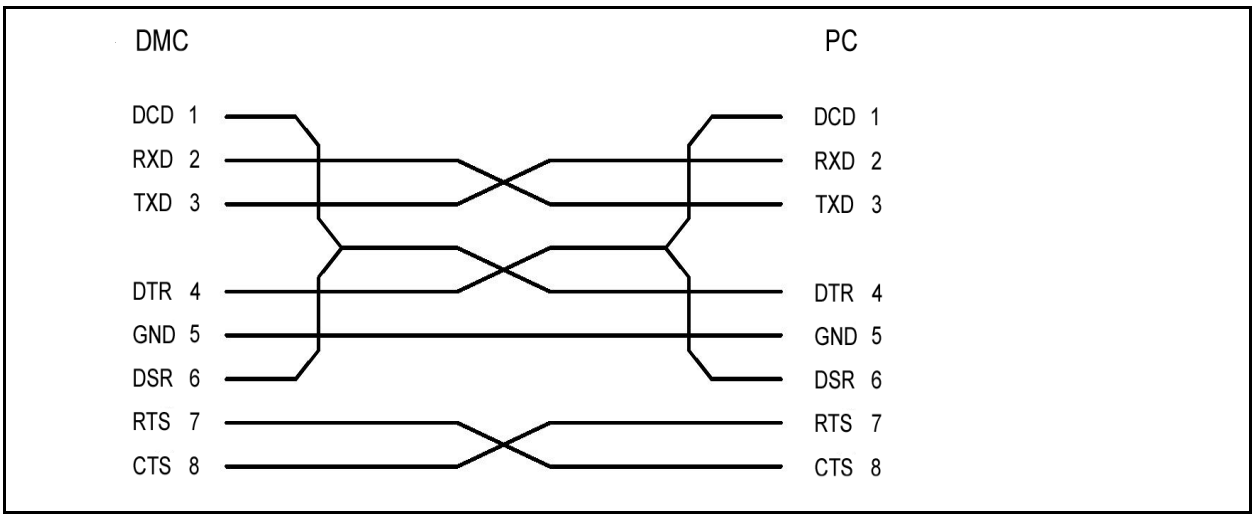
You can connect a computer to the DMC in the following ways:

- Direct connection (serial connection) using a null-modem cable
- Remote connection using a serial-IP converter or a modem

Direct connection (serial connection) using a null-modem cable

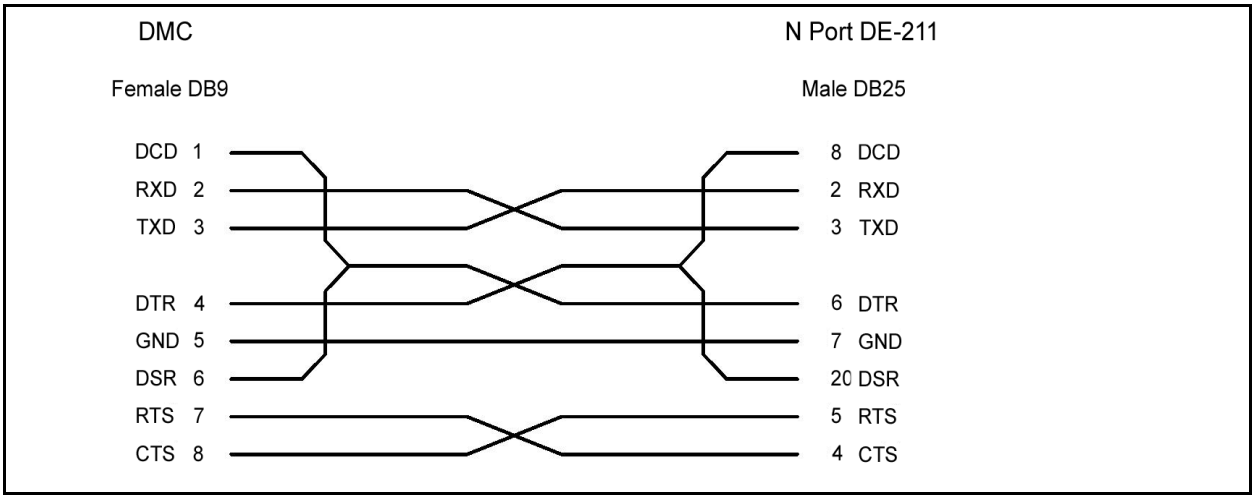
The serial port of the DMC is a 9-pin DSUB male connector for direct connection between the computer and DMC. When connecting a computer to the DMC in a serial connection, use a null-modem cable. Refer to "Description of connectors and their placement" on page 33.

Figure 49 Null-modem cable



Remote connection using a serial-IP converter or a modem

Figure 50 IP modem cable



Serial-IP converter

The serial port of the DMC is a 9-pin DSUB male connector and can be used with an RS232 serial-IP converter for remote access to the DMC. Use a null-modem cable between the DMC and the serial-IP converter.

Note: We recommend the use of the serial-IP converter from MOXA model DE-211.

How to use the serial-IP converter from MOXA model DE-211

1. Put all dip switches to OFF position.
2. Obtain or make an IP modem cable (see Figure 50).
3. Power up the NPort DE-211.
4. Install the MOXA software on your computer.
5. Configure the NPort DE-211 to program the IP adress and adjust the serial parameters to be compatible with the ones outlined in Table 14.
6. Associate a virtual Com port to the NPort DE-211.
7. Start the DMC OAM program and select the virtual Com port of the NPort DE-211.

Note: For more detailed information, refer to the hardware and software installation guide supplied by MOXA for correct installation and configuration of the NPort DE-211.

Modem

The serial port of the DMC is a 9-pin DSUB male connector and can be used with an RS232 cable for remote access to the DMC through a standard modem.

Before connecting the modem to the DMC, ensure that the modem has been configured for the following default Com port settings of the DMC:

Table 14 Default Com port settings

Baud:	115200 bit/sec.
Data bit:	8
Parity:	None
Stop bit:	1
Flow control:	Hardware: DCD, DSR, DTR, CTS, RTS

Configuring the DMC through DMC OAM program

From the DMC OAM program it is possible to configure the DMC on following parameters that are useful when setting up the system.

Note: Configuring the DMC requires the use of the DMC OAM program. A Hyper terminal session with the DMC is not possible.

Parameter:	**Action:**
Change password	When starting the DMC OAM program you will be prompted a password. The default password is: **default**. It is recommended to change this password at the earliest opportunity.
Suppression Control	If necessary, you can change the suppression level to make the handsets function better in different noisy environments.
Subscription	The subscription setting must be set to **Allow Subscription** before additional handsets can be subscribed to the system. This allows the DMC to send out its ARI code so the handsets read which system to log onto.
Cable delay	Following the installation of the DMC and the base station, a cable delay measurement must be taken in order to synchronize the system. The cable delay measurement will trigger the system to reboot and all calls will be dropped.

For more information about installing and opening the DMC OAM program, refer to “Installing DMC OAM and Digital Mobility Service Tool” on page 45.

This section provides information about

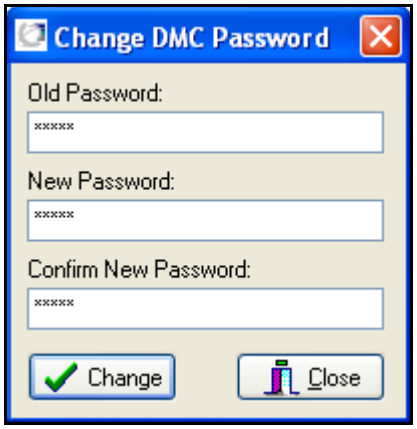
- “Change password” on page 95
- “Suppression control” on page 95
- “Subscription setting” on page 96
- “Cable Delay Measurement” on page 97

Change password

1 On the **Settings** menu, click **Change Password.**

A **Change DMC Password** dialog box appears.

Figure 51 Change DMC OAM password



2 Type your old password in the **Old Password** field.

3 Type the new password in the **New Password** field.

Maximum length of a password is 15 characters.

4 Type the new password again in the **Confirm New Password** field.

5 Click **Change**.

The password used when starting the DMC OAM program has now been changed.

Suppression control

Using the **Suppression Control** command makes the handsets function better in different noisy environments.

Note that this setting is only available through the DMC OAM program. The Master handset cannot provide this information.

The purpose of the suppressor is to suppress an echo which is not fully suppressed by the build-in echo canceller. The suppressor makes the connection effectively simplex, forcing the speakers not to interrupt one another.

Caution: Only use the **Suppression Control** command if performance of the build-in echo canceller is insufficient. Only tune and test the parameters with great care to minimize undesirable side effects such as distorted or fluctuating audio.

1 On the **Settings** menu, click **Suppression Control**.

A **Suppression Control** dialog box appears.

Figure 52 Suppression control through the DMC OAM

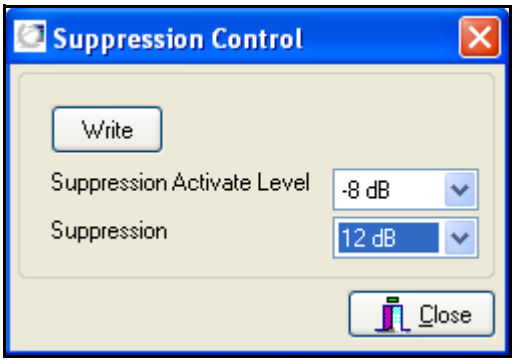


Table 15 Example of suppression control values

Suppression Activate Level	Suppression	Used in
-26 dB	9 dB/12 dB	Office
-20 dB	9 dB/12 dB	Light noisy environment
-17 dB	9 dB/12 dB	Heavy noisy environment
-8 dB	9 dB/12 dB	Extreme noisy environment

Suppression with 9 dB decreases the decibel count by 65 per cent.

Suppression with 12 dB decreases the decibel count by 75 per cent.

2 Select a value from the **Suppression Activate Level** list.

The **Suppression Activate Level** is the level at which the suppression is to be activated.

3 Select a value from the **Suppression** list.

Suppression is the number of decibels (dB) the sound is suppressed, when activated.

4 Click **Write** to write the new settings to the DMC.

5 Click **Close** to close the dialog box.

Subscription setting

When powering up the DMC, subscription mode is active for 10 minutes. If more time is needed:

- Select the **Allow Subscription** check box in the **Registration** tab. This will keep subscription mode active until the DMC OAM program is closed.

Cable Delay Measurement

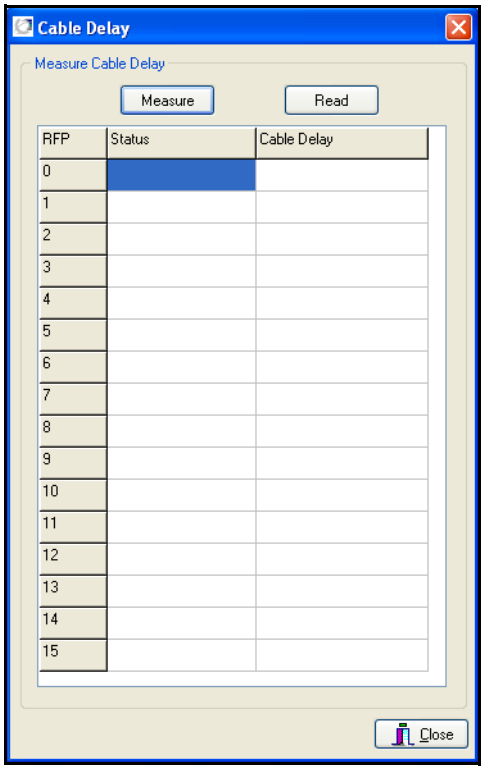
The **Measure Cable Delay** command is used to measure the delay from the DMC to the base stations (RFPs).

Note: The delay must be measured the first time after a base station has been connected in order to synchronize the base station. The synchronization ensures seamless handovers.

1 On the **Settings** menu, click **Measure Cable Delay**.

A **Cable Delay** dialog box appears.

Figure 53 Measuring cable delay through the DMC OAM



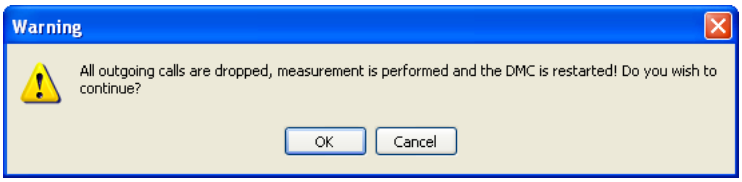
Status shows whether the base station (RFP) is running or not.

2 Click **Read** to acquire the data from the DMC.

3 Click **Measure** to make the DMC measure the delay (measurement can take a few minutes).

A warning message appears.

Figure 54 Measuring cable delay warning


Warning
All outgoing calls are dropped, measurement is performed and the DMC is restarted! Do you wish to continue?
OK
Cancel

4 Click **OK** to continue.

5 Click **Close** to close the dialog box.

Configuring the DMC through the Master handset

From the Master handset it is possible to configure the DMC on a few parameters that are useful when setting up the system. The parameters are:

Parameter:	Action:
Restart	If necessary, you can restart the system.
Subscription	The subscription setting must be set to **Allow Subscription** before additional handsets can be subscribed to the system. This allows the DMC to send out its ARI code so the handsets read which system to log onto.
Cable delay	Following the installation of the DMC and the base station, a cable delay measurement must be taken in order to synchronize the system. The cable delay measurement will trigger the system to reboot and all calls will be dropped.

Note: For suppression control you need to use the DMC OAM program, see “Configuring the DMC through DMC OAM program” on page 94.

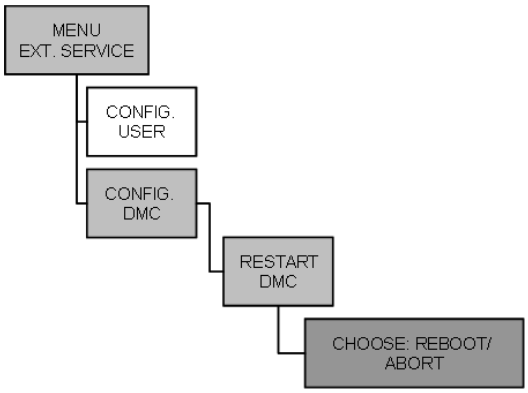
For more detailed information on the Master handset, see “Configuring the DMC” on page 91.

This section provides information about

- “Restart the DMC” on page 99
- “Subscription setting” on page 99
- “Cable delay measurement” on page 100

Restart the DMC

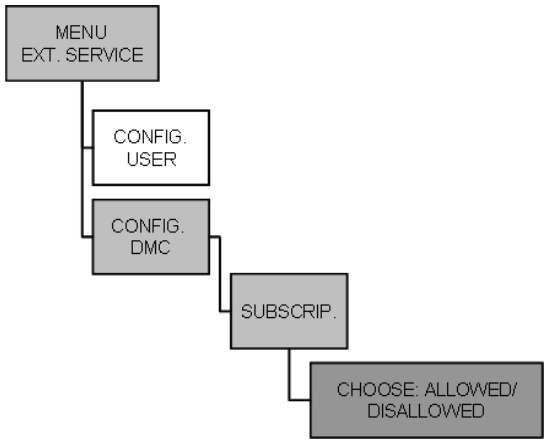
Figure 55 Master handset: restart DMC



1. Press **MENU (≣)** - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. DMC**.
3. Press ✓/**OK** - go to **RESTART DMC**.
4. Press ✓/**OK**.
5. Select **REBOOT** to confirm or **ABORT** to exit the rebooting process.
6. Press ✓/**OK** - to confirm your selection. The system will reboot if **REBOOT** has been selected.

Subscription setting

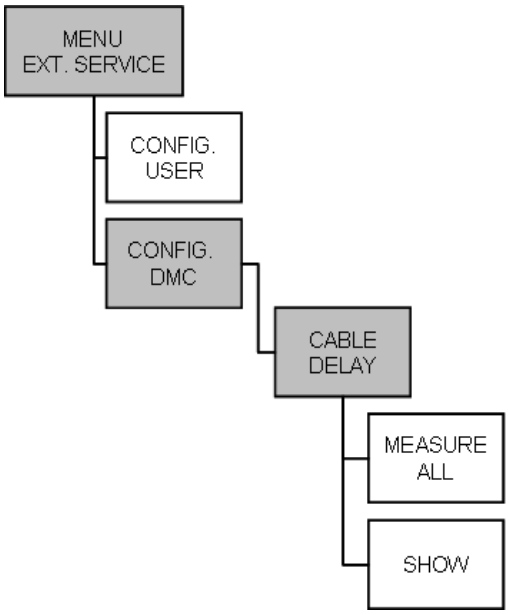
Figure 56 Master handset: subscription



1. Press **MENU (≣)** - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. DMC**.
3. Press ✓/**OK** - go to **SUBSCRIP**.
4. Select **ALLOWED** to allow handset to be subscribed to the system. Select **DISALLOWED** to prevent handsets from being subscribed.
5. Press ✓/**OK** - to confirm your selection.

Cable delay measurement

Figure 57 Master handset: cable delay



1 Press **MENU (≣)** - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **CONFIG. DMC**.

3 Press ✓/**OK** - go to **CABLE DELAY**.

4 Press ✓/**OK** - go to **MEASURE ALL.**

5 Press ✓/**OK**.

Note: The system is rebooted and all calls are dropped.

To view the cable delay of an individual base station

1 Press **MENU (≣)** - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **CONFIG. DMC**.

3 Press ✓/**OK** - go to **CABLE DELAY**.

4 Press ✓/**OK** - go to **SHOW.**

5 Press ✓/**OK**.

The cable delays for each base station is visible in the display. Use the < > keys to view the cable delay for each base station.

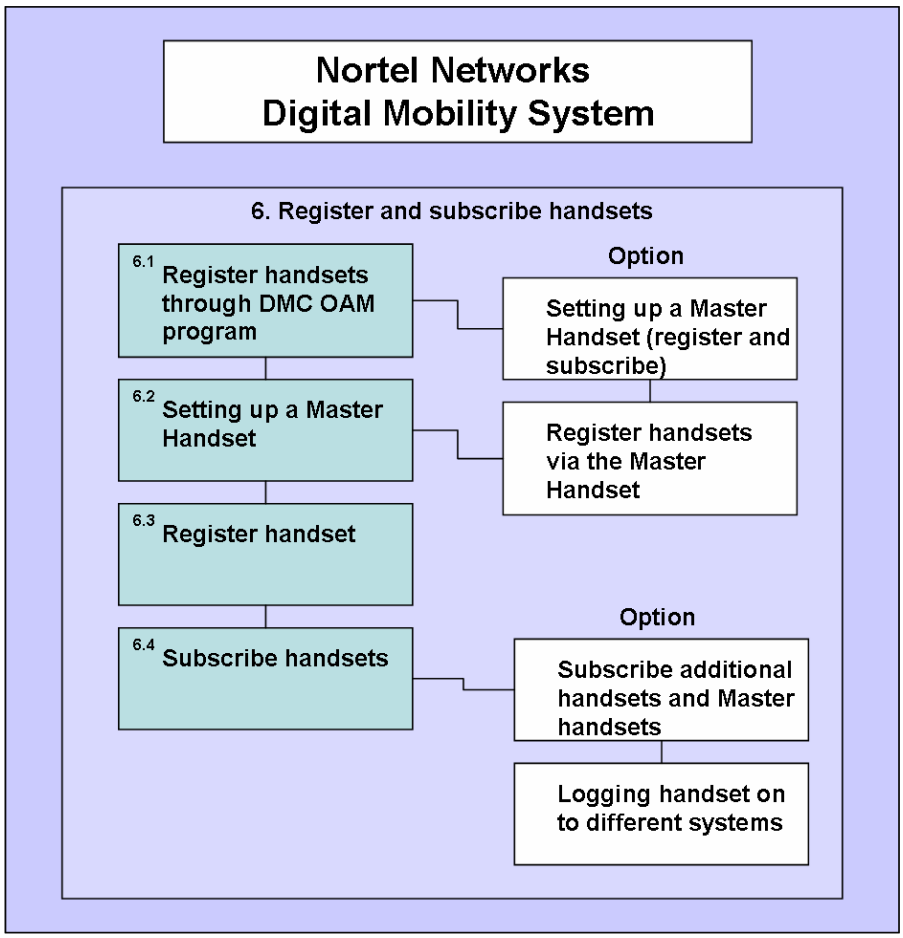
Next step

To register and subscribe handsets, go to Chapter 8.

Chapter 8
Handset registration and subscription

This section provides you with information about handset registration and subscription. You must register and subscribe a handset before you can use it. The section also contains information about host system features and host system and handset interoperability.

Figure 58 Register and subscribe handsets


Nortel Networks
Digital Mobility System
6. Register and subscribe handsets
6.1 Register handsets through DMC OAM program
Option
Setting up a Master Handset (register and subscribe)
6.2 Setting up a Master Handset
Register handsets via the Master Handset
6.3 Register handset
6.4 Subscribe handsets
Option
Subscribe additional handsets and Master handsets
Logging handset on to different systems

This section includes information about:

- “Register handsets through DMC OAM program” on page 102
- “Register handsets through Master handset” on page 105
- “Subscribe handsets” on page 109
- “Host system and handset interoperability” on page 111

When registering handsets you enter information about the handset settings (such as; the handset serial number, name, directory number etc.) in the system database. When subscribing handsets you subscribe a registered handset to the system for usage. If the handset is not registered in the system database, subscription of the handset is not possible.

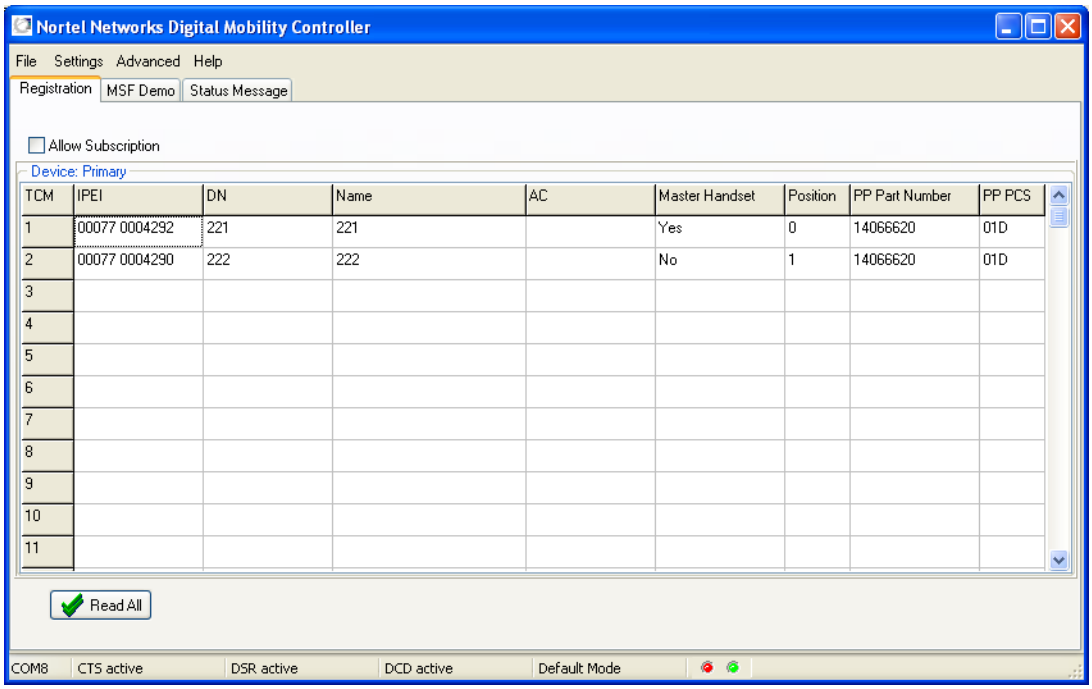
Register handsets through DMC OAM program

This section provides information about:

- “Setting up a Master handset” on page 103
- “Registering handsets” on page 104

When a connection between a DMC and the system is established, the DMC OAM program displays all the information for registering handsets. Subscription data is read and shown in the **Registration** tab screen.

Figure 59 Registration tab



Variable	Description
TCM	Digital loop identifier (from the DMC)
IPEI	International Portable Equipment Identity (the serial number of the handset)
Directory No	The directory number (DN) of the handset
Name	The name of the handset
AC	Authentication Code (an optional code that can be used when subscribing handset to DMC)
Master Handset	The special rights for the handset
Position	Position in database
Device	Primary or Secondary DMC

Variable	Description
TCM	Digital loop identifier (from the DMC)
PP Part Number	The part number of the handset (read by DMC)
PP PCS	The PCS of the handset (read by DMC)

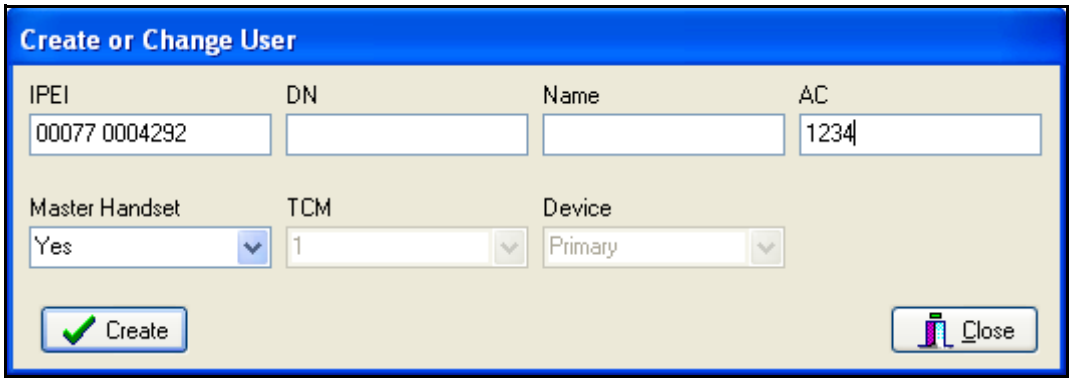
Setting up a Master handset

1 In the **Registration** tab, click **Read All** to display all registered users on the DMC.

2 Alternate-click on an empty row, and then click **Create**.

A **Create or Change User** dialog box appears.

Figure 60 DMC OAM: create or change user record



3 In the **IPEI** field, type the serial number of the handset.

This is found either on a label under the battery, on the packaging label, or by pressing *99984*✓/**OK** the handset to be registered. The serial number consists of a five-digit handset type (manufacturer code) and then a seven-digit handset number, separated by a space.

Refer to "Installation prerequisites" on page 44.

4 **DN** field: Read only. The DN of the handset is given by the host system after the handset has been subscribed to the system.

5 **Name** field: Read only. The name of the handset is given by the host system after the handset has been subscribed to the system.

6 In the **AC** field, type the authentication code (optional).

The authentication code is a subscription password of a maximum eight digits, defined by the technicians, and can be used when connecting the handset to the DMC. The AC is a subscription pin code for the individual handset.

Refer to "Installation prerequisites" on page 44.

7 From the **Master Handset** list, select **Yes**.

8 Click **Create** to register the Master handset.
A confirmation message appears when the handset is registered.

9 Repeat steps 1 to 8 for each new Master handset to be registered to the system.

10 From the Main window, select the **Allow Subscription** check box. If not selected, subscription mode is only active for 10 minutes after the DMC has been powered up.

Note: As a security measure, subscription mode is disabled when the DMC OAM program is closed.

11 Once the Master handset details have been entered into the registration screen of the DMC OAM program, the Master handset can be subscribed to the system.

For more information about subscription of handsets, see "Subscribe handsets" on page 109.

Registering handsets

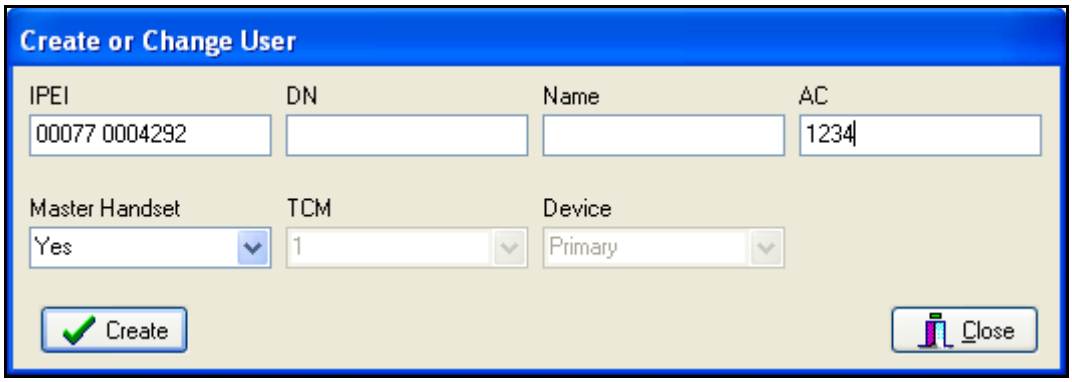
Refer to "Configuring the DMC through DMC OAM program" on page 94 for information about allowing subscription.

1 In the **Registration** tab, click **Read All** to display all registered users on the DMC.

2 Alternate-click on an empty row, and then click **Create**.

A **Create or Change User** dialog box appears.

Figure 61 DMC OAM: create or change user record



3 In the **IPEI** field, type the serial number of the handset.

This is found either on a label under the battery, on the packaging label or by pressing *99984*✓/**OK** the handset to be registered. The serial number consists of a 5-digit handset type (manufacturer code) and then a 7-digit handset number separated by a space.

Refer to "Installation prerequisites" on page 44.

4 **DN** field: Read only. The DN of the handset is given by the host system after the handset has been subscribed to the system.

5 **Name** field: Read only. The name of the handset is given by the host system after the handset has been subscribed to the system.

6 In the **AC** field, type the authentication code (optional).

The authentication code is a subscription password of max. eight digits, defined by the technicians, and can be used when connecting the handset to the DMC. The AC is a subscription pin code for the individual handset.

Refer to "Installation prerequisites" on page 44.

7 From the **Master Handset** list, select **No**.

8 Click **Create** to register the handset.

A confirmation message appears when the handset is registered.

9 Repeat steps 1 to 8 for each new handset to be registered to the system.

10 From the Main window, select the **Allow Subscription** check box. If not selected, subscription mode is only active for 10 minutes after the DMC control unit has been powered up.

11 Once the handset details have been entered into the registration screen of the DMC OAM program, the handset can be subscribed to the system. Subscription of handsets requires the use of each registered handset and is not to be handled through the DMC OAM program.

For more information about subscription of handsets, see "Subscribe handsets" on page 109.

Register handsets through Master handset

This section provides information about:

- "Setting up a Master handset (registering and subscribing)" on page 105
- "Registration of additional handsets" on page 106

Note: Before subscription of the master handset and the following registration of the individual handsets, make sure that the handsets have been fully charged prior to the registration process. When charging the battery for the first time it is necessary to leave the handsets in the charger for 14 - 16 hours in order to secure full charging.

Setting up a Master handset (registering and subscribing)

1 Before registering a Master handset, you need to power up the DMC. Refer to "Powering up the DMC" on page 92.

When powering up the DMC, the system automatically enters into subscription mode for 10 minutes. This is the time that is available to subscribe the first handset which automatically becomes the Master handset.

Note: Registration of the first handset - the Master handset - is done automatically when subscribing the handset to the system.

2 Power up the handset by pressing the **HOOK**-key ( ).

3 Press **MENU ( )**.

4 Press < - go to **MENU LOGIN**

5 Press ✓/**OK**.

6 Press > - go to **SUBSCRIPTION CREATE**.

7 Press ✓/**OK**. The handset will now search for the serial number of the system.

8 As soon as the right serial number of the system appears in the display press ✓/**OK**. (The serial number is indicated on the label on the rear of the DMC).

Refer to "Installation prerequisites" on page 44.

9 **CREATE SYSTEM 1 AC**: _____ (Authentication Code is optional)

Choose system no. - press ✓/**OK**.

An antenna symbol will appear in the display to indicate a successful subscription.

The handset has now become the Master handset for the system and will be placed on TCM loop no. 1.

Refer to "Installation prerequisites" on page 44.

Note: It is possible to have more than one Master handset. Registration and subscription of additional Master handsets through a Master handset follows the same procedure as for registering additional handsets and subscribing handsets, which is described in the next section. This means that an additional Master handset is not registered automatically when subscribing it to the system.

Registration of additional handsets

Before registering additional handsets can take place, the handsets are assigned to the host system to configure the DN record for each handset. Note that each DN relates directly to one TCM port on the host system, which, in turn, relates directly to a TCM port on the DMC. For more information about host systems, see "Host system and handset interoperability" on page 111.

The Master handset can add additional handsets to the system using two methods, depending on the registration scenario:

- when the system is being set up and additional handsets are being registered for the first time
- after system setup and additional handset are being added, either by filling free capacity, or by linking another DMC to increase system capacity

First time registration of additional handsets through the Master handset

1 Press **MENU (≣)** - go to **EXT. SERVICE**. (See illustration of menu structure on the next page).

2 Press ✓/**OK** - go to **CONFIG. USER**.

3 Press ✓/**OK** - go to **ADD**.

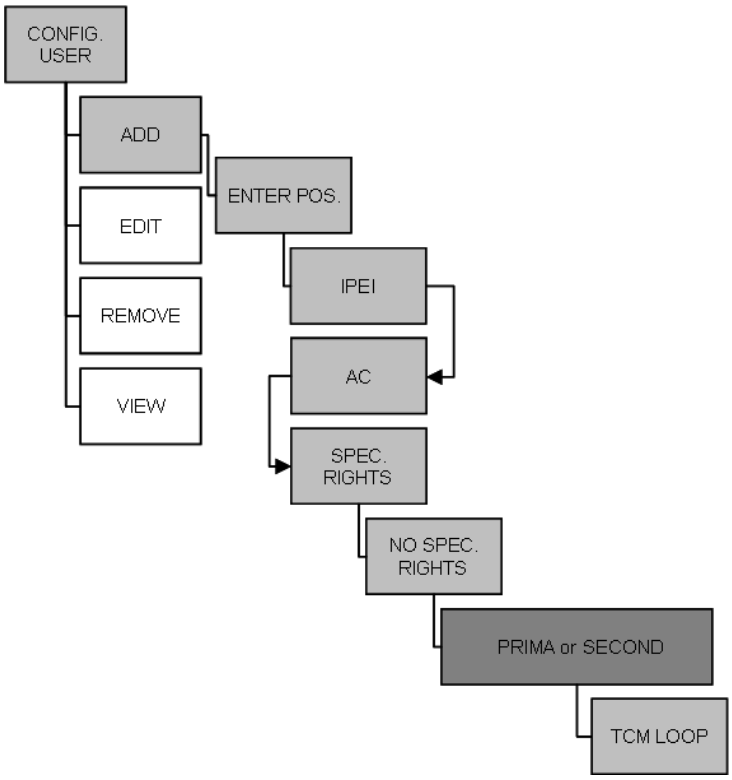
4 Press ✓/**OK** - go to **ENTER POS.**

5 Press ✓/**OK** - enter the position of additional handsets.

6 Press ✓/**OK** - **IPEI** appears in the display. Type the serial number of the handset. The IPEI serial number is found on the label behind the battery pack.

Alternatively, press *99984*✓/**OK** on the handset to be registered. The serial number is now shown in the display.

Figure 62 Master handset: register handsets



Note: The serial number has to be entered as continuous numbers.

Refer to "Installation prerequisites" on page 44.

7 Press ✓/**OK** - **AC** appears in the display. Type an authentication code (max. eight digits) (AC is optional). Refer to "Installation prerequisites" on page 44.

8 Press ✓/**OK** - **SPEC. RIGHTS** appears in the display. Special rights are only given to additional Master handsets. Select **No SPEC. RIGHTS**.

9 Press ✓/**OK** - Select **PRIMA** or **SECOND**. Secondary is only an option if the handset is being registered on a linked system. In a linked system there is a Primary DMC and a Secondary DMC.

10 Press ✓/**OK** - **TCM LOOP** appears in the display. Type the TCM loop number of the chosen Primary or Secondary DMC, and then press ✓/**OK**. Refer to "Installation prerequisites" on page 44.

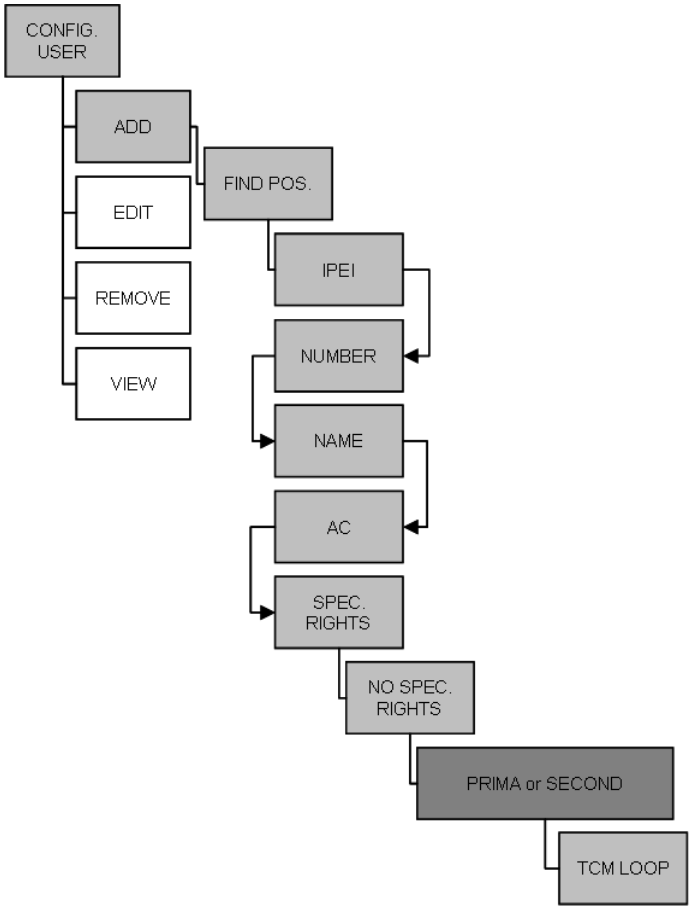
A SUCC. message appears in the display.

11 To register another handset, press ✓/**OK** and repeat steps 2 to 10**.**

12 Press **MENU (≣)** to exit.

Registering handsets to existing system through Master handset

Figure 63 Master handset: register handsets to existing system



1 Press **MENU (≣)** - go to **EXT. SERVICE**. (See illustration of menu structure on the next page).

2 Press ✓/**OK** - go to **CONFIG. USER**.

3 Press ✓/**OK** - go to **ADD**.

4 Press ✓/**OK** - go to **FIND POS.**

5 All the systems positions and directory numbers can now be displayed using the < > keys. Find the wanted positions.

6 Press ✓/**OK** - **IPEI** appears in the display. Type the serial number of the handset.

- The IPEI serial number is found on the label behind the battery pack.
- Alternatively, press *99984*✓/OK on the handset to be registered. The serial number is now shown in the display.

Note: The serial number has to be entered as continuous numbers.

Refer to “Installation prerequisites” on page 44.

7 Press ✓/**OK** - **AC** appears in the display. Type an authentication code (max. eight digits). (AC is optional). Refer to “Installation prerequisites” on page 44.

8 Press ✓/**OK** - **SPEC. RIGHTS** appears in the display. Special rights are only given to additional Master handsets. Select **NO SPEC. RIGHTS**.

9 Press ✓/**OK** - Select **PRIMA** or **SECOND**. Secondary is only an option if the handset is being registered on a linked system.

10 Press ✓/**OK** - **TCM LOOP** appears in the display. Type the TCM loop no. of the chosen Primary/Secondary DMC, and then press ✓/**OK**. Refer to “Installation prerequisites” on page 44.

A SUCC. message appears in the display.

11 To register another handset, press ✓/**OK** and repeat steps 2 to 10**.**

12 Press **MENU** (≣) to exit.

Subscribe handsets

This section provides information about:

- "Subscribing additional handsets and additional Master handsets" on page 109
- "Subscribing a handset to different systems" on page 110

Note: Subscription of handsets requires the use of each registered handset.

Note: To make subscriptions, the system must allow subscriptions to be made. Some systems also require an Authentication Code (AC). If more than one system currently permits subscription, you will need to know the ID of the system (ARI code) to which you wish to subscribe. Authentication Codes and system ID's (ARI codes) will be provided by the system administrator.

Refer to "Installation prerequisites" on page 44 for information about Authentication Codes.

Before subscribing handsets you need to ensure:

- that handset battery has been charged ("Preparing handset for use" on page 83)
- that the handsets have been registered to the system ("Register handsets through DMC OAM program" on page 102 or "Register handsets through Master handset" on page 105)
- that subscription is allowed ("Configuring the DMC through DMC OAM program" on page 94)

Subscribing additional handsets and additional Master handsets

1. Press **MENU (≣)** - go to **MENU LOGIN**.
2. Press ✓/**OK** - go to **SUBSCRIPTION CREATE** to subscribe to a system.
3. Press ✓/**OK**. The handset searches for the serial number of the system.
4. Use the < > keys to scroll between the IDs systems if there is more than one system available.

   During subscription, the handset searches for free positions and performs subscription on the first free position.
5. As soon as the correct serial number of the system appears in the display, press ✓/**OK**.
   The serial number is located on the label on the rear of the DMC.
6. Enter the AC (if required) using the keyboard, and press ✓/**OK**.

   An antenna symbol appears on the display to indicate a successful subscription. If not, the subscription has failed and the procedure must be retried.

Subscribing a handset to different systems

The handset can be subscribed (connected) to a maximum of 10 different systems.

Note: To be able to log on to a system, subscription to the system must be established.

Changing to another system automatically

Note: Auto login should only be used when systems are separate, with no overlaps.

1. Press **MENU (≣)** - go to **MENU LOGIN**.
2. Press ✓/**OK** - go to **SELECT LOGIN**.
3. Press ✓/**OK** - go to **SELECT LOGIN AUTO**.

   The handset automatically selects a system.

   The selected system is marked with an **A**.

Changing to another system manually

If you would like to change to another system:

1. Press **MENU (≣)** - go to **MENU LOGIN**.
2. Press ✓/**OK** - go to **SELECT LOGIN** to subscribe to a system.

   The actual chosen system is marked with an ***** or an **A** (if auto login is selected).
3. Press ✓/**OK** - use the **< >** keys to scroll between the IDs of the different systems to find the system to which you want to connect.

   Under **SELECT LOGIN** only subscriptions display. Free positions do not display.
4. Press ✓/**OK** to confirm.

Host system and handset interoperability

Note: The model name and any programming that is specific to the handsets (i.e. handsfree) must be set to N.

The Digital Mobility phone accesses many features from the host system, and must be configured into a DN record on the host system. This section provides a brief overview of the settings and features that are unique or different for the handset.

Refer to the respective programming documentation for the host system for details about DN records.

This section provides information about:

- "Digital Mobility DN record settings" on page 111
- "Handset features" on page 112
- "Idle display activation code" on page 112
- "Handset system functions" on page 115

Digital Mobility DN record settings

Digital Mobility phones are controlled through DN records, as are all the other telephony devices attached to the system. Digital Mobility phones are identified with model name **DMC prtb** on the DN record.

Note: The location of the DN record and the fields will vary, depending on what type of host system your are using.

Following is a table of DN record settings that are required for this handset:

Table 16 DN record required settings

Field name	Required setting
Model (Mdl)	DMC prtb
Assigned lines/line pools	Ensure that all lines and line pools assigned to the telephone have an assigned Prime telephone so a call can transfer to that telephone if the handset loses the radio signal
Answer DN	Set to Ring-only
Handsfree	Set to N
HF Answerback	Set to N
Allow redirect	Set to N
SM supervisor	Set to N
Auto hold for incoming page	Set to N (handsets cannot receive pages)
SWCA assign.	Assign system-wide call appearance assignments
Button programming	Not applicable

Table 16 DN record required settings

Field name	Required setting
Dialing options	Standard only. Auto-dial is set-based
Language	Only affects display prompts generated from the host system
Contrast	Set-based adjustment
Ring type	Set-based adjustment
The rest of the settings in the DN record are set in the same way as you would program any other system telephone.	

Note: Norstar programming: The handset supports using FEATURE**SETS to add SWCA call group assignments to the handset. Set all assignments to Ring-only.

Handset features

The following section describes features that are controlled at the handset or that are functionally unique to the Digital Mobility Phone.

Refer to the *Telephony Feature User Card* for details about using the system features. This card indicates which features are available to these handsets.

Telephone settings

The following telephone settings are controlled at the handset:

Setting	What it affects
dialing options	handset allows auto dial
language	handset menu; affects only set-based prompts
volume control	handset volume controls
mute	Mute key
contrast	handset menu
ring type	handset menu

Idle display activation code

There is no core display on the handset when it is in idle mode. To view the current display information in this mode, press the **FEATURE** key ( ) twice in succession (FEATURE + FEATURE) to obtain the three-second display.

The following will be the priority of idle display features on the handset:

Highest to lowest priority

Service Modes and Restrictions

- Display regarding these will appear only if the handset set is the control set
- If there is a message waiting, the MSG softkey displays
- If there are call logs, the CALLS softkey will also appear.

Do Not Disturb

- *Do Not Disturb* displays
- If there is a message waiting, the MSG softkey displays
- If there are call logs, the CALLS softkey also displays.

Call Forward

- *Forward <name>* displays on the first line. CANCEL and FWD # softkeys.
- If there is a message waiting, the MSG softkey displays
- If there are call logs, the CALLS softkey also displays.

Static Time and Date Feature

- Time and Date display on the first line
- If there is a message waiting, the MSG softkey displays
- If there are call logs, the CALLS softkey also displays.

Message Waiting

- *Message for you* displays
- MSG softkey displays
- If there are call logs, the CALLS softkey also displays.

Call logs

- *Call for you* displays. CALLS softkey displays.

Time and Date

- System time and Date display.

Features with three-second display timeouts

The following feature displays have a three-second display timeout.

F*520	Park on First Free SWCA
F*521-F*536	System Wide Call Appearances
F*537	Retrieve Oldest SWCA Call
F*538	Retrieve Newest SWCA Call
F803	Show Time and Date
F815	Call Log Autobumping On
F#815	Call Log Autobumping Off
F816	Callback and Auto Redial
F818	Call Charge Information
F819	ONN Blocking
F#819	Cancel ONN Blocking
F870	Display Service Mode
F871	Ringing Service
F#871	Cancel Ringing Service Manual Override
F872	Restriction Service
F#872	Cancel Restriction Service Manual Override
F873	Routing Service
F#873	Cancel Routing Service Manual Override
F875	Hospitality Room Alarm
F#875	Cancel Hospitality Room Alarm
F876	Hospitality Room Condition
F877	Hospitality Desk Alarm
F878	Hospitality Desk Room Condition
F879	Hospitality Desk Room Occupied

Handset system functions

The following section describes functions that are unique to the handset.

- As long as the external line the call comes in on has a designated prime set, if the handset loses radio contact, the call transfers to the prime set. In this situation, held calls and local calls are dropped.
- Use the **Recall** key (**R**) key to toggle between an active call and a call on hold.
- Held calls:
  - near end releases the call: held call becomes a ringing call
  - remote end releases the call: near end presses the Recall key to access the held call or waits three seconds and the call becomes a ringing call
  - if **R** is pressed during a call: call goes on hold and the handset presents a 15-second dial tone. After the dial tone timeout, the held call becomes a ringing call
- Long tones (F808): set the DTMF tones to three seconds per key press
- Dial tone timeout is set to 15 seconds and is controlled by the core.

For details about using the handset features, refer to the *Digital Mobility Phone User Guide*.

Chapter 9
Handset management

This sections provides information on handset management.

- "Viewing handset/user configuration" on page 117
- "Unsubscribing handsets" on page 119
- "Removing handsets from the list (deregistering)" on page 119
- "Changing user settings" on page 122
- "Downloading firmware" on page 125

Viewing handset/user configuration

Through the DMC OAM program and the Master handset, it is possible to view all the user configurations of the wireless system.

This section includes information about viewing user configuration:

- "Through DMC OAM program" on page 117
- "Through Master handset" on page 118

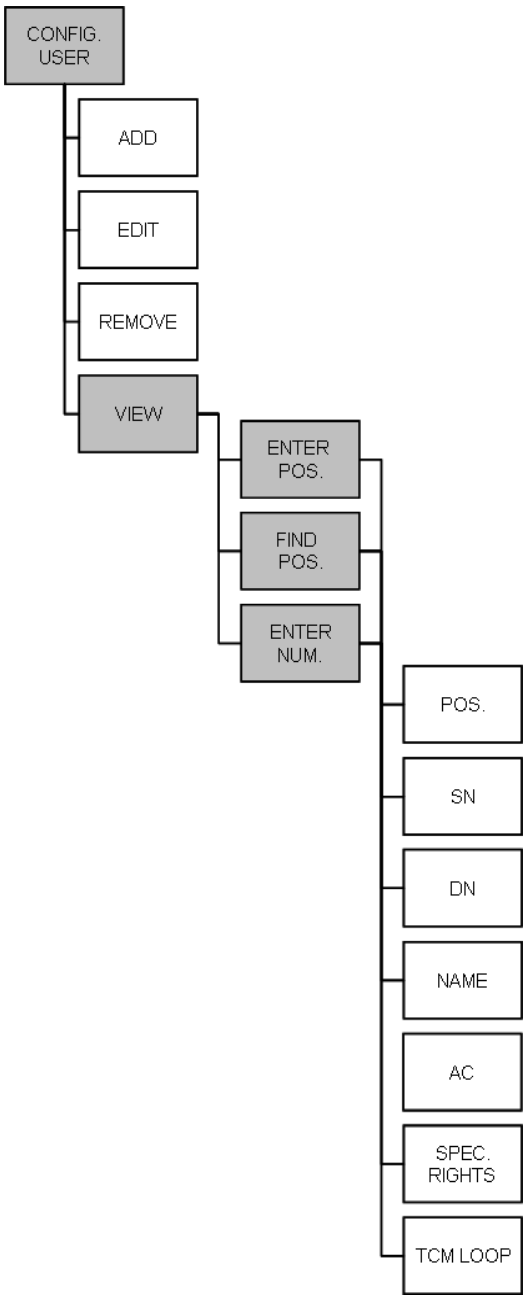
Through DMC OAM program

The DMC OAM program enables you to view all the user configurations of the wireless system.

- In the **Registration** tab, click **Read All** to display all registered users and their configuration on the DMC.

Through Master handset

Figure 64 Master handset: viewing user configurations



The Master handset enables you to view all the user configurations of the wireless subsystem. The individual handset configuration has to be accessed through either the position or directory number of that handset.

Viewing user configuration

1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓**/OK** - go to **CONFIG. USER**.
3. Press ✓**/OK** - go to **VIEW**.
4. Press ✓**/OK** - go to either:
   - **ENTER POS.**
   - **FIND POS.**
   - **ENTER NUM.**
5. Select/type the position or type the directory number of the handset to view its settings.
6. Press ✓**/OK** - the following configuration details are now visible:

   POS. - The position

   SN - Serial number/IPEI

   DN - Directory number (extension number)

   NAME - Name of the handset user

   AC - Authentication code

   SPEC. RIGHTS - ON/Off, if ON the handset is registered as a Master handset.

   TMC LOOP - the allocated DMC channel for the handset
7. Press **MENU** (≣) to exit the menu.

Unsubscribing handsets

Note: Unsubscription of handsets requires the use of each handset to be unsubscribed from the system, therefore you cannot use the Master handset or the DMC OAM program for unsubscription. On a Master handset you can only unsubscribe the Master handset itself.

Note: Removing a subscription requires a password. Password default is: 0000.

To unsubscribe a handset:

1. Press **MENU** (≣).
2. Press **<** - go to **MENU LOGIN**.
3. Press ✓**/OK.**
4. Press **<** - go to **SUBSCRIPTION REMOVE**.
5. Press ✓**/OK.**
6. Enter password (0000).
7. Press ✓**/OK.**

   The handset has been unsubscribed.

Removing handsets from the list (deregistering)

You can deregister handsets from both the DMC OAM program and the Master handset. This is necessary when:

- you must replace the handset due to loss or breakage.
- you want to assign the handset to a user with a different telephone number.

This section provides information about:

- "Deregistering handsets through DMC OAM program" on page 120
- "Deregistering handsets through Master handset" on page 120

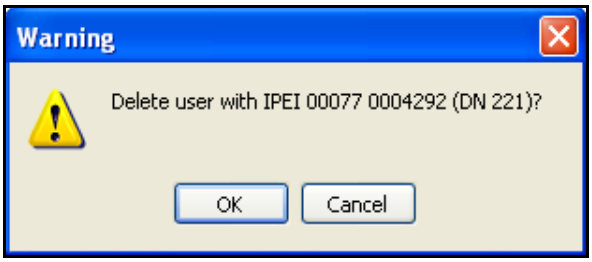
Deregistering handsets through DMC OAM program

1 In the **Registration** tab, click **Read All** to display all registered users on the DMC.

2 Alternate-click on the cell containing the serial number of the handset in question, and then click **Delete**.

A **Warning** window appears.

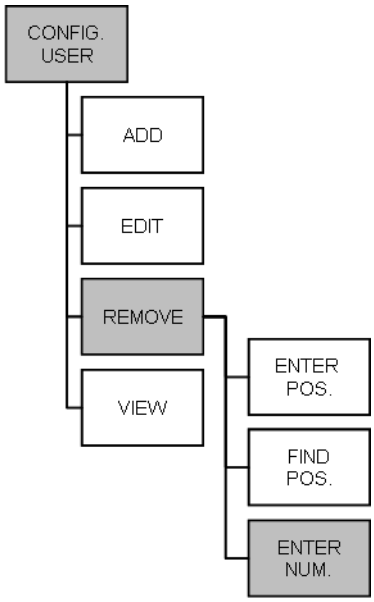
Figure 65 Registration delete warning



3 Click **OK** to confirm.

Deregistering handsets through Master handset

Figure 66 Master handset: Deregister a handset record



The Master handset can remove a user from the system either by removing the directory number or by removing the user from an allocated position.

Removing a directory number

1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓**/OK** - go to **CONFIG. USER**.

3 Press ✓**/OK** - go to **REMOVE**.

4 Press ✓**/OK** - go to **ENTER NUM.**

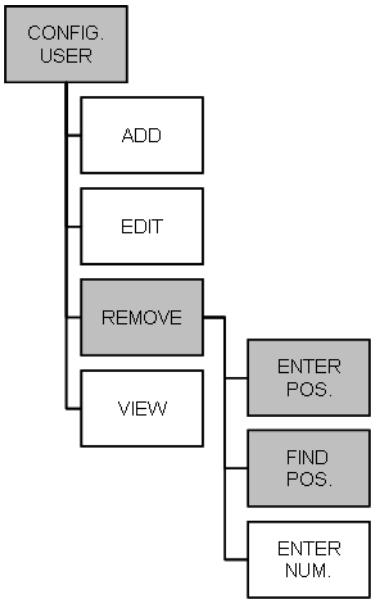
5 Press ✓**/OK**.

6 Type the directory number to be removed.

7 Press ✓**/OK** - if SUCC. message appears in the display, the directory number has been removed.

Removing a position

Figure 67 Master handset: Deregister a handset record



1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. USER**.
3. Press ✓/**OK** - go to **REMOVE**.
4. Press ✓/**OK** - go to **FIND POS.** or if the position to be removed is known go to **ENTER POS.**
5. Press ✓/**OK** - select or type the position to be removed.
6. Press ✓/**OK**- if SUCC. message appears in the display, the position has been removed.

Changing user settings

You can change user settings, such as the AC (authentication code) using either the DMC OAM program or the master handset.

This section includes:

- "Through DMC OAM program" on page 122
- "Through the Master handset" on page 123

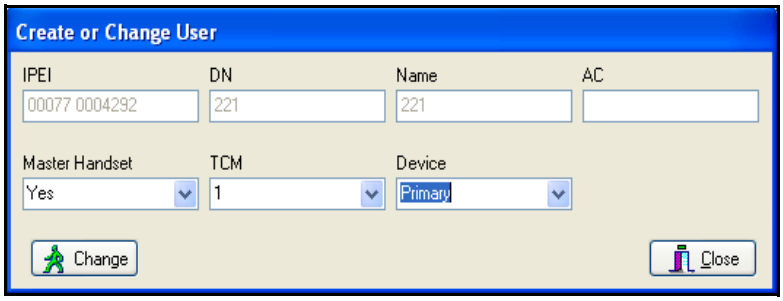
Through DMC OAM program

1 In the **Registration** tab, click **Read All** to display all registered users on the DMC.

2 Alternate-click on the cell containing the serial number of the handset in question, and then click **Change**.

A **Create or Change User** dialog box appears.

Figure 68 DMC OAM create/change user record



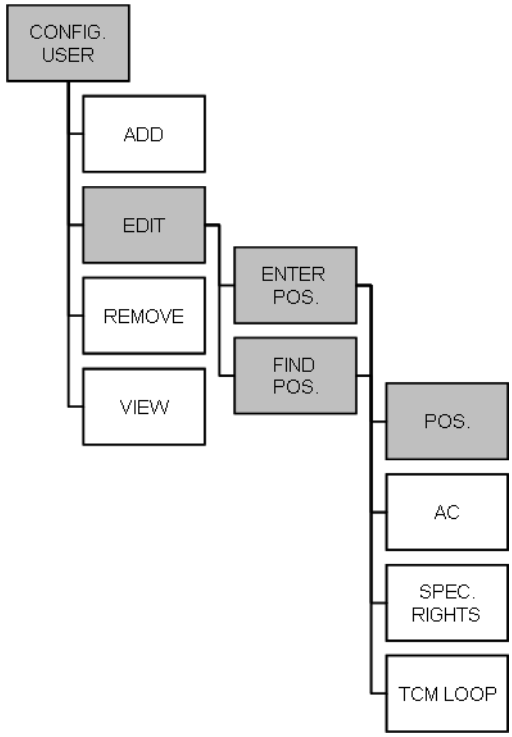
3 Change settings, and click **Change** to confirm.

Through the Master handset

The Master handset has the capability to edit the following handset parameters for all registered handsets: Position, authentication code (AC), special rights, and TCM loop number.

Changing position

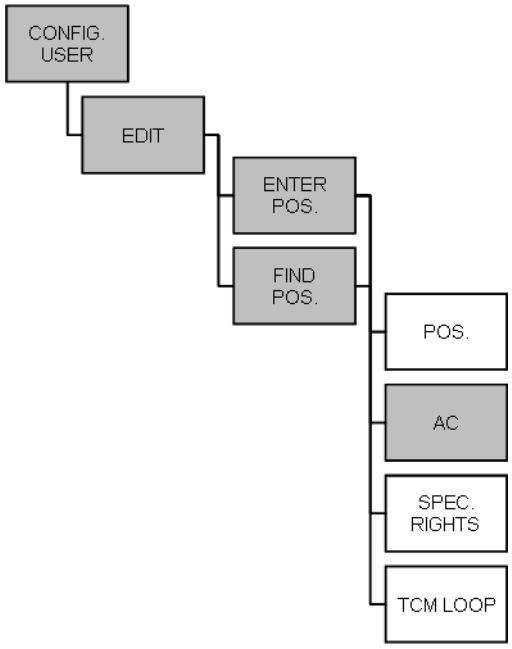
Figure 69 Master handset: Changing a position



1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. USER**.
3. Press ✓/**OK** - go to **EDIT**.
4. Press ✓/**OK** - go to **FIND POS.** and select the position from the list, or if the position to be changed is known go to **ENTER POS.** and enter the position.
5. Press ✓/**OK** - the selected/entered position is shown in the display with a **change to** prompt. Enter the new position.
6. Press ✓/**OK** - if SUCC. message appears in the display, the new position has been accepted.

Changing authentication code

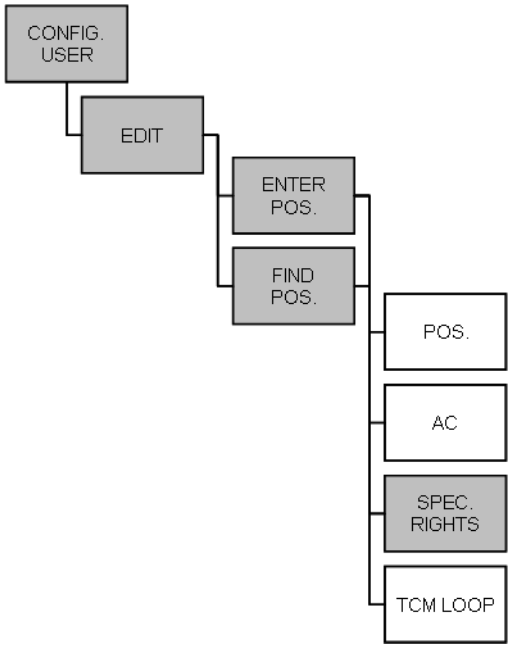
Figure 70 Master handset: Changing an AC



1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. USER**.
3. Press ✓/**OK** - go to **EDIT**.
4. Press ✓/**OK** - go to **FIND POS.** and select the position from the list, or if the position to be changed is known go to **ENTER POS.** and enter the position.
5. Press ✓/**OK** - go to **AC**.
6. Press ✓/**OK** - the selected AC is shown in the display with a **change to** prompt. Enter the new AC code (max. eight digits).
7. Press ✓/**OK** - if SUCC. message appears in the display, the new AC has been accepted.

Changing special rights

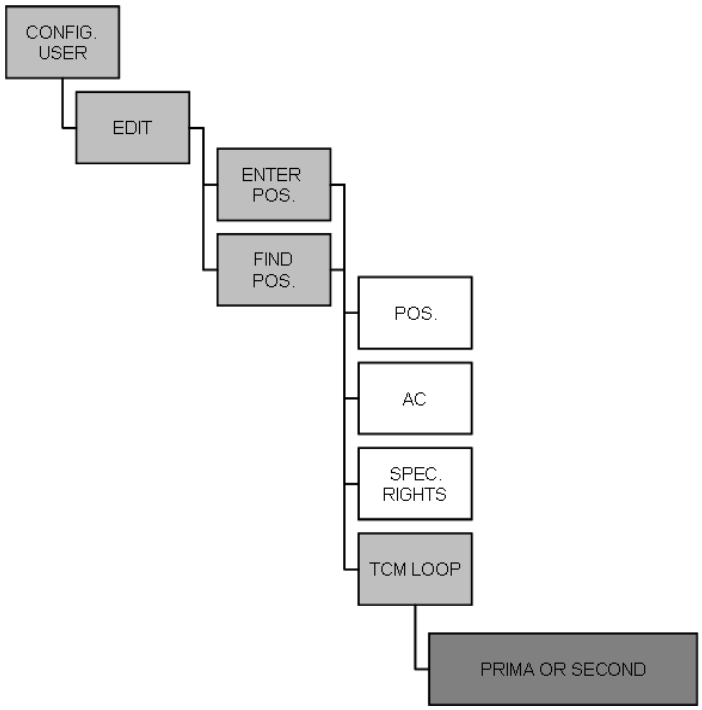
Figure 71 Master handset: Changing special rights



1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **CONFIG. USER**.
3. Press ✓/**OK** - go to **EDIT**.
4. Press ✓/**OK** - go to **FIND POS.** and select the position from the list, or if the position to be changed is known go to **ENTER POS.** and enter the position.
5. Press ✓/**OK** - go to **SPEC. RIGHTS**.
6. Press ✓/**OK** - select between the two options: **SPEC. RIGHTS** or **NO SPEC. RIGHTS** to give the handset a Master handset status.
7. Press ✓/**OK** - to confirm the special rights selection. A SUCC. message appears in the display.

Changing TCM loop number

Figure 72 Master handset: Changing a TCM loop number



1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **CONFIG. USER**.

3 Press ✓/**OK** - go to **EDIT**.

4 Press ✓/**OK** - go to **FIND POS.** and select the position from the list, or if the position to be changed is known go to **ENTER POS.** and enter the position.

5 Press ✓/**OK** - go to **TCM LOOP**.

6 Press ✓/**OK** - select between the two options: **PRIMA** or **SECOND,** depending on which DMC the TCM loop number should be changed.

7 Press ✓/**OK** - The Primary/ Secondary TCM loop number is shown in the display with a **change to** prompt. Enter the new TCM loop number

8 Press ✓/**OK** - if SUCC. message appears in the display, the new TCM loop number has been accepted.

Downloading firmware

Refer to "Download Flash" on page 153 for information about firmware downloads to the handset.

Chapter 10
System Management

This section provides you with information about the DMC OAM program and the Digital Mobility Service Tool and describes how the programs are used for system management. It also describes how to read system information through the Master handset.

This section provides information about:

- "Using the DMC OAM program" on page 127
- "Using the Digital Mobility Service Tool" on page 132
- "Define and view system settings" on page 135
- "Advanced features" on page 142
- "Troubleshooting error messages" on page 156

Using the DMC OAM program

The DMC OAM program is used for registration of handsets, sending MSF messages (Message Service Function) and viewing status information.

This section provides information about:

- "Registration" on page 127
- "MSF Messages (Message Service Function)" on page 127
- "Checking Status Information" on page 131

Registration

For information about registration, see "Register handsets through DMC OAM program" on page 102.

MSF Messages (Message Service Function)

With the **MSF Demo** tab you can send text messages to any MSF compatible handset connected to the DMC. Also any MSF-compatible handset connected to the DMC can send text messages to the DMC.

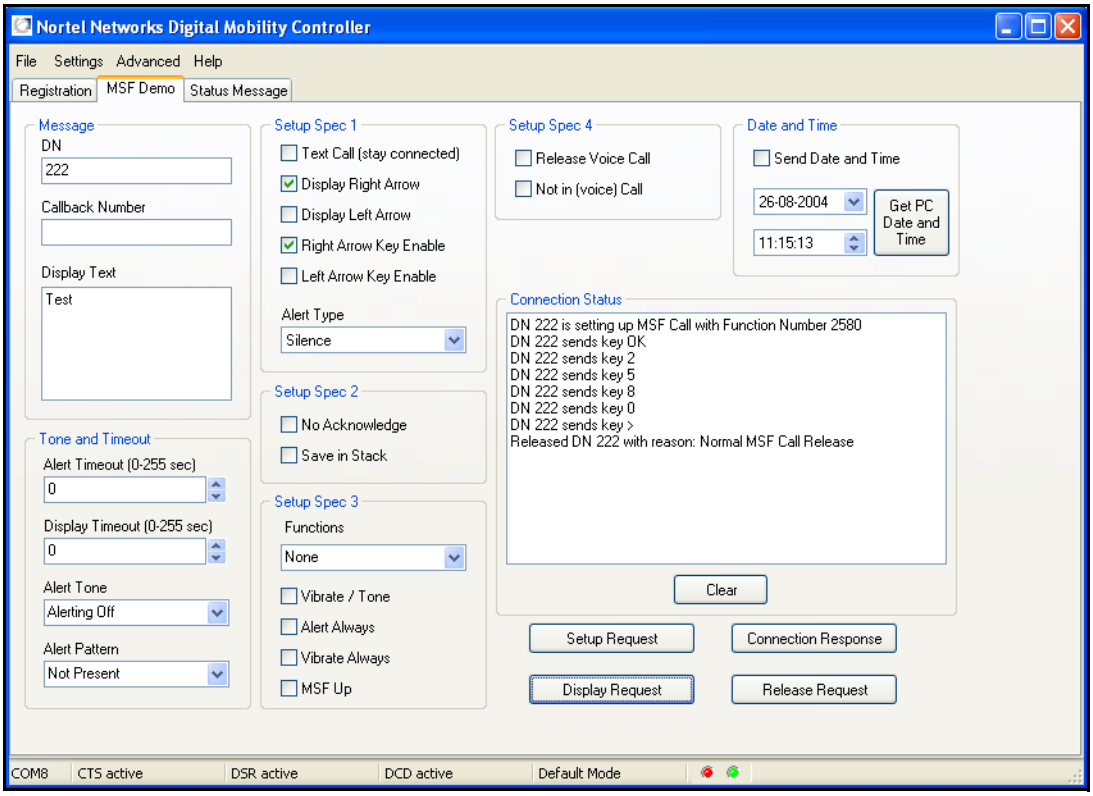
Note: The **MSF Demo** tab is only a demo of messaging services, but it can be used for some very simple messaging. It is the interface intended to be used by a third-party application, such as an alarm server.

Note: The protocol on the RS232 port of the DMC has elements for administration and maintenance of the DMC and base stations. It also has a set of **Supplementary Service** elements useful for remote control applications, for paging systems, and for exchanging written messages. Those are designed for use by third-party application developers, which typically addresses

specific niche markets, such as care facilities, hotels, prisons and mental institutions. The DMC OAM program is not developed to fulfill any of those needs. Some of the **Supplementary Service** elements are most useful in automatic systems/applications, therefore, only a subset of the features is shown in the **MSF Demo** tab.

Sending text messages from DMC to a handset

1 From the **Main** window (of the DMC OAM program), click the **MSF Demo** tab.



2 In the **Message** area, type the directory number of the receiver handset and the message to be sent. If you want the receiver to call you back, you can also type a callback number.

3 In the **MSF Demo** tab you can also define different settings for the receiver handset, such as how the handset displays the message, and how the display behaves when receiving an MSF.

- **Setup Spec 1**: Use these fields to define how the display on the receiver handset behaves when receiving a text message.
- **Setup Spec 2**: Use these fields to define how the receiver handset handles the text message.
- **Setup Spec 3**: Use these fields to define how the receiver handset acts when receiving a text message.
- **Setup Spec 4**: Use these fields to define how the receiver handset handles voice calls when receiving a text message.

- **Tone and Timeout**: Use these fields to define the type of tone the receiver handset sends when receiving a text message.
- **Date and Time**: Use these fields to set date and time, and send this information with the text message.

4 If you want to stay connected and send more than one text message, select the **Text Call (stay connected)** check box in the **Setup Spec 1** area.

5 Click **Setup Request** to send the text message.

6 In the **Connection Status** area, an MSF connection confirmation from the receiver handset is displayed when the text message is received (to confirm the connection the user of the handset must press ✓**/OK** on the handset).

If an error occurs during connection, or if the handset releases the call, a release text appears in the **Connection Status** area. The release text could, for example, be one of the following:

Normal release	the text message has been received by handset
Timer expiry	time-out occurred when trying to send MSF to handset
Handset is out of range	no contact to handset established
Handset is busy	handset is busy with another MSF connection
Unknown handset	the handset is unknown to the system - check directory number

7 If you have received a connection confirmation, and if you selected the **Text Call (stay connected)** check box in the **Setup Spec 1** area, the DMC is still connected to the handset and it is possible to send more text messages.

- Type the new text message in the **Display Text** field (**Message** area), and then click **Display Request**.

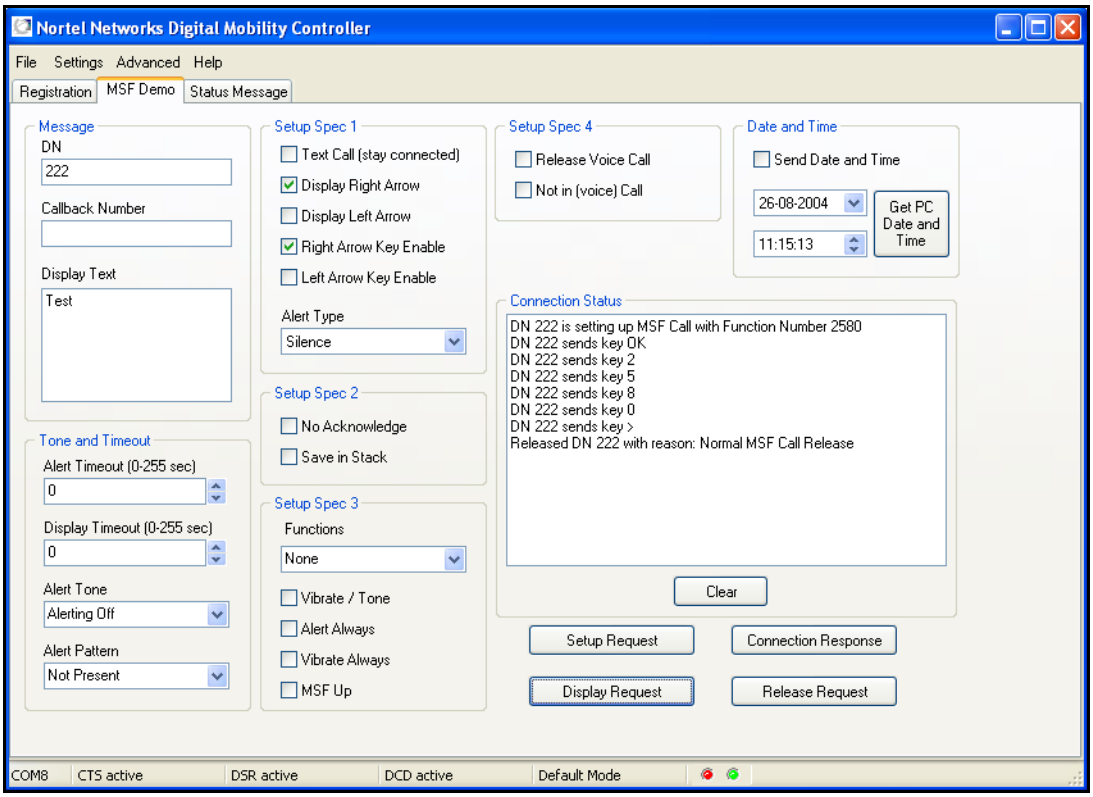
8 To release the connection to the handset:

- If the **Text Call (stay connected)** check box is not selected, then the call is automatically released after the transfer of message.
- If the **Text Call (stay connected)** check box is selected, click **Release Request** to release the connection.

9 Click **Clear** to clear the **Connection Status** area.

Receiving text messages from handset to DMC

1 From the **Main** window (of the DMC OAM program), click the **MSF Demo** tab.



2 The **Connection Status** area shows if a text message has been sent from a handset to the DMC.

3 To respond to the message and set up a connection, type the DN of the handset in the **Message** area. The DN is shown in the **Connection Status** area. Then, click **Connection Response**.

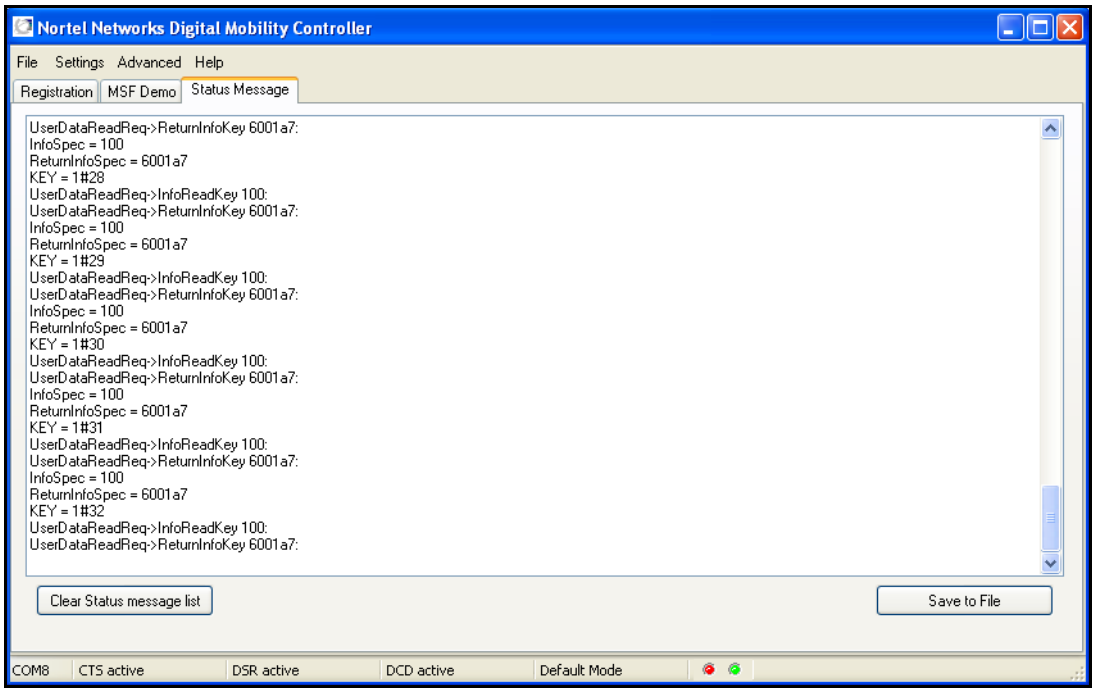
4 To release the connection to the handset, type the DN of the handset in the **Message** area. The DN is shown in the **Connection Status** area. Then, click **Release Request**.

5 Click **Clear** to clear the **Connection Status** area.

Checking Status Information

In the **Status Message** tab all received status messages from the DMC is shown (a text string with debug information from the DMC). It provides an overview of activities performed in the system.

Figure 73 Status Message tab



The frequency of arrival of these status messages is determined by the status message level. The level can have a value between 0 and 3. A value of 3 makes the DMC send a message very often, and a value of 0 (zero) disables most messages.

How to set status message level

- On the **Advanced** menu, point to **Set Message Level**, and select the wanted level.

  A confirmation of the change of status message level is shown in the status bar.

How to read status message level

1 On the **Advanced** menu, point to **Read Message Level**. A **Status Message** window appears showing the current status message level in the DMC.

2 Click **OK**.

Using the Digital Mobility Service Tool

The Digital Mobility Service Tool is used for repeater programming and handset adjustment.

This section provides information about:

- "Repeater programming" on page 132
- "Handset adjustment" on page 132

Repeater programming

For information about repeater programming, see "Programming the repeater with the Digital Mobility Service Tool" on page 78.

Handset adjustment

The programming kit for handset 7420 (NT7B65LL) (see illustration below) consists of:

- serial cable
- programming stand
- 110V power supply

The programming kit for handset 743X, 744X and 745X (NT7B65LK) consists of:

- serial cable
- modular connector adaptor

  Note: For adjusting the handset 743X, 744X and 745X you use the charger accompanying the handset.

Note: For adjusting the handset you also need the programming software (Digital Mobility Service Tool). The Digital Mobility Service Tool is not part of the programming kit. The program can be downloaded from the host system CD for Norstar systems and from under the Client Install button on the Business Communications Manager Unified Manager first page.

Set up of the hardware for handset adjustment:

1 Connect the serial cable to the programming stand/charger and Com port of your computer.

2 Place the handset in the programming stand/charger.

The handset is now ready for programming via the Digital Mobility Service Tool.

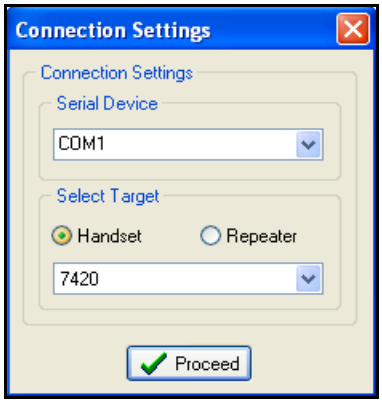
To adjust the handset from the Digital Mobility Service Tool:

1 Before you start adjusting the handset, ensure that the programming stand/charger is connected to the computer and that the handset is placed in the programming stand/charger (Refer to "Set up of the hardware for handset adjustment:" on page 133).

2 Open the **Digital Mobility Service Tool** on your desktop.

A **Digital Mobility Service Tool** window appears.

Figure 74 Digital Mobility Service Tool connection screen



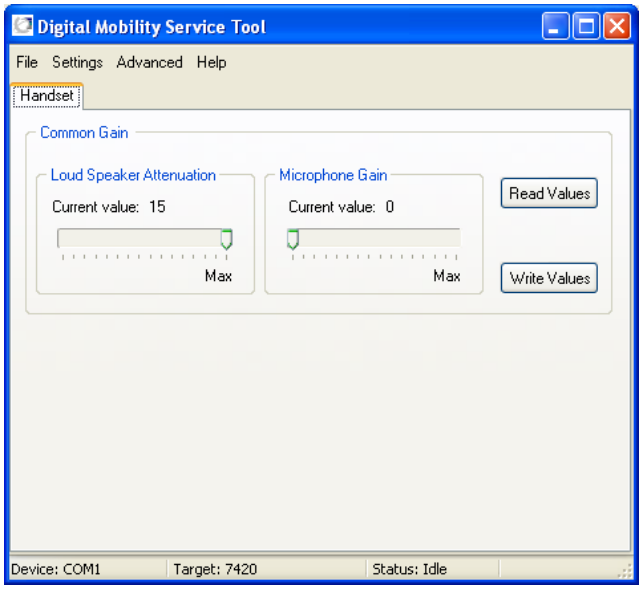
3 Select a Com port from the **Serial Device** list.

4 Click **Handset**, and then select the desired handset model from the list.

5 Click **Proceed**.

When a handset 7420 is selected, the following dialog box appears.

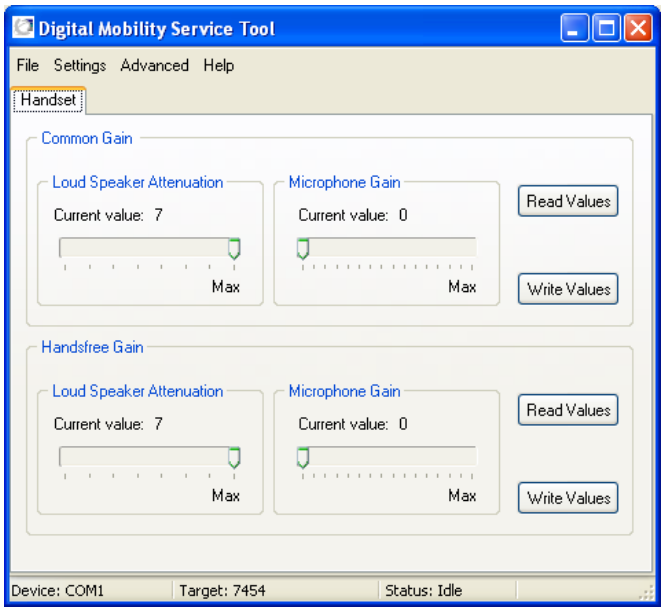
Figure 75 Digital Mobility Service Tool model 7420 handset screen



A message is shown in the status bar when handset is connected.

When a handset model that can be used handsfree, such as 744X and 745X, is selected, the following dialog box appears.

Figure 76 Digital Mobility Service Tool model 744X and 745X handset screen



6 Under **Common Gain**, click **Read Values** to display the current values for the loud speaker volume and microphone gain.

7 Change the values, and then click **Write Values**.

8 If adjusting a handset that can be used handsfree:
- Under **Handsfree Gain**, click **Read Values** to display the current values for the loud speaker volume and microphone gain.
- Change the values, and then click **Write Values**.

9 To adjust another handset:
- Select the **Connection Settings** command from the **Settings** menu.
- Select a handset from the list in the appearing **Connection Settings** dialog box, and then repeat steps 5 to 8.

10 On the **File** menu, click **Exit**. This will close the program. The handset has now been adjusted.

Define and view system settings

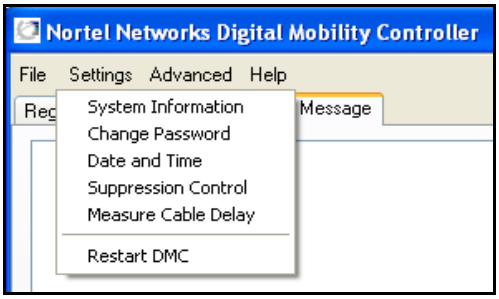
Through the DMC OAM program, the Digital Mobility Service Tool and the Master handset it is possible to define and view different settings of the system.

This section provides information about:

- "System settings in the DMC OAM program" on page 135
- "System settings in the Digital Mobility Service Tool" on page 138
- "System settings in the Master handset" on page 139

System settings in the DMC OAM program

From the **Settings** menu in the DMC OAM program you can reach commands for viewing and defining system settings.



This section contains a description of each of these commands:

- "System Information" on page 136
- "Change Password" on page 136
- "Date and Time" on page 136
- "Suppression Control" on page 137
- "Measure Cable Delay" on page 137
- "On the Settings menu, click Restart DMC." on page 137

System Information

This information may be used when troubleshooting or diagnosing problems in the system.

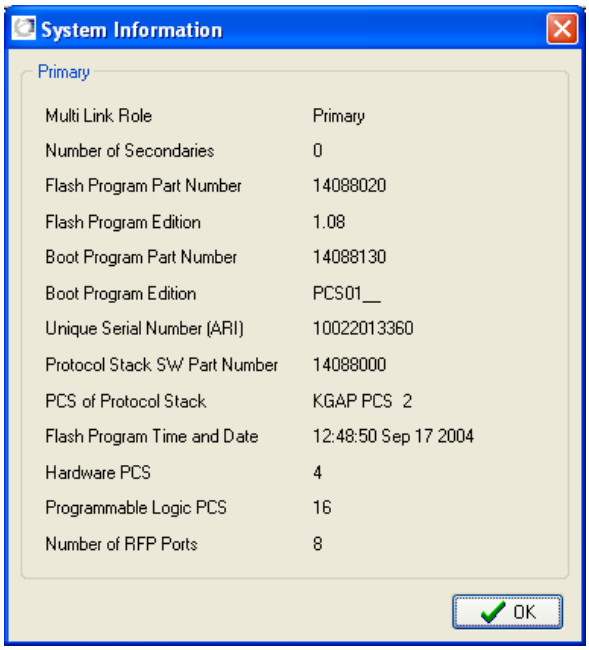
Figure 77 DMC OAM: System Information

1 On the **Settings** menu, click **System Information**.

A **System Information** window appears.

The window contains miscellaneous information from the DMC.

2 Click **OK** to close the window.



Change Password

The **Change Password** command is used for changing the password, that you will be prompted when starting the DMC OAM program.

Refer to "Change password" on page 95 for the procedures for changing a password.

Date and Time

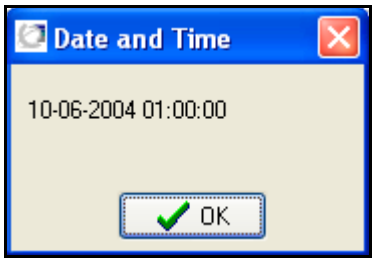
Figure 78 DMC OAM: Date and Time

1 On the **Settings** menu, click **Date and Time.**

A **Date and Time** dialog box appears.

The dialog box contains information on DMC system time. The date and time are read from the host system.

2 Click **OK** to close the dialog box.



Suppression Control

Using the **Suppression Control** command makes the handsets function better in different noisy environments.

Refer to "Suppression control" on page 95 for more information on suppression control.

Measure Cable Delay

The **Measure Cable Delay** command is used to measure the delay from the DMC to the base stations.

Note: The delay must be measured the first time after a base station has been connected.

For more information about cable delay measurement, refer to "Cable Delay Measurement" on page 97.

Restart the DMC

1 On the **Settings** menu, click **Restart DMC**.

A warning message appears.

Figure 79 Restart DMC warning

2 Click **OK** to continue.

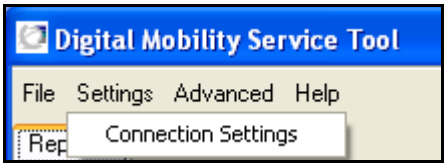
The DMC is restarted and after a little while (depending on system size it can take from a few seconds up to a few minutes), both base stations, repeaters and handsets are ready for use again.

System settings in the Digital Mobility Service Tool

From the **Settings** menu in the Digital Mobility Service Tool you can reach a **Connection Settings** command. Using this command you can easily change Com port settings, change to another repeater or handset without having to close the program after each repeater programming, handset adjustment, or software download.

This section contains a description of:

- "Connection Settings" on page 138



Connection Settings

1 On the **Settings** menu, click **Connection Settings**.

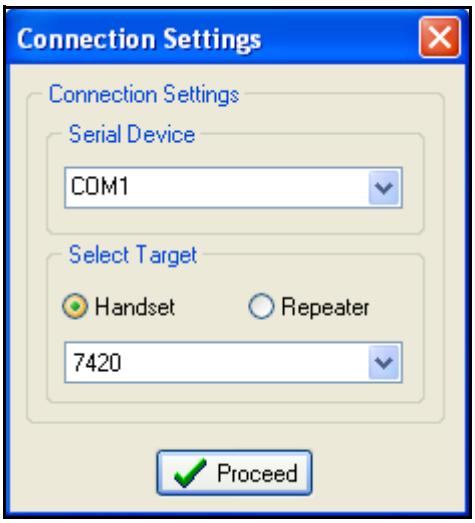
A **Connection Settings** dialog box appears.

2 Select a Com port from the **Serial Device** list.

3 Click either **Handset** or **Repeater,** and then select the handset/repeater in question.

4 Click **Proceed**.

Figure 80 Digital Mobility Service Tool: Connection Settings



System settings in the Master handset

This section provides information about reading out system information and handset information using the Master handset.

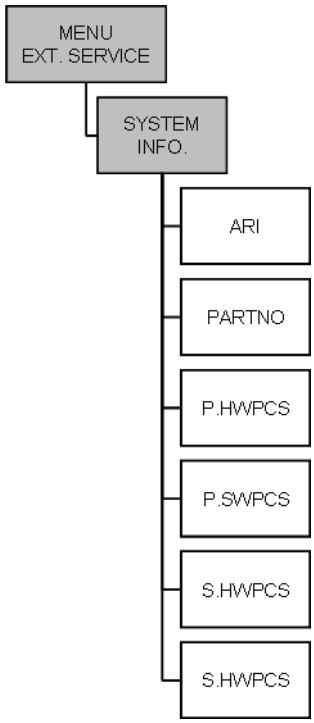
This section provides information about:

- "Reading system information from a Master handset" on page 139
- "Reading handset information from a Master handset" on page 140
- "Reading base station information from a Master handset" on page 140
- "Reading statistics from a Master handset" on page 141

Reading system information from a Master handset

The Master handset can read out system information as a quick way of checking the DMC settings.

Figure 81 Master handset: system information



1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓**/OK** - go to **SYSTEM INFO**.

3 Press ✓**/OK**.

The following DMC settings can be accessed:

ARI - The ARI code of the DMC

PARTNO - The part number of the DMC software

P.HWPCS - The Primary DMC hardware edition number

P.SWPCS - The Primary DMC software edition number

S.HWPCS - The hardware edition number of the Secondary DMC in a linked system

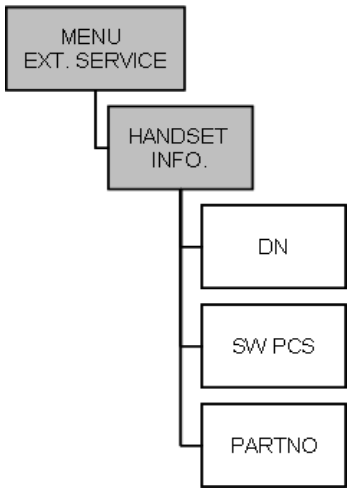
S.SWPCS - The software edition number of the Secondary DMC in a linked system

Note: For information on Boot Program Part Number, Boot Program Edition, PCS of Protocol Stack, Flash Program Time and Date, Programmable Logic PCS and Number of RFP Ports you need to use the DMC OAM program, refer to System Information on page 136.

Reading handset information from a Master handset

The Master handset can read out information of the individual handsets.

Figure 82 Master handset: handset information



1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **HANDSET INFO**.

3 Press ✓/**OK**.

The following information can be accessed:

DN - (Directory number) The extension number of the handset

SW PCS - The part number of the handset software

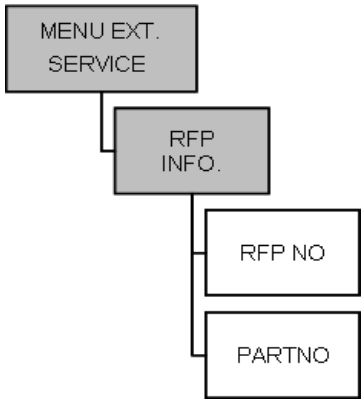
PARTNO - The handset software edition number

All the above three lines appear in the display. Use the < > keys to scroll to the next/previous handset.

Reading base station information from a Master handset

Base station number and the software editions of the base stations can be viewed from the Master handset.

Figure 83 Master handset: base station information



1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **RFP INFO**.

3 Press ✓/**OK**.

The following information can be accessed:

RFP NO - The number of the base station

PARTNO - The part number of the base station software

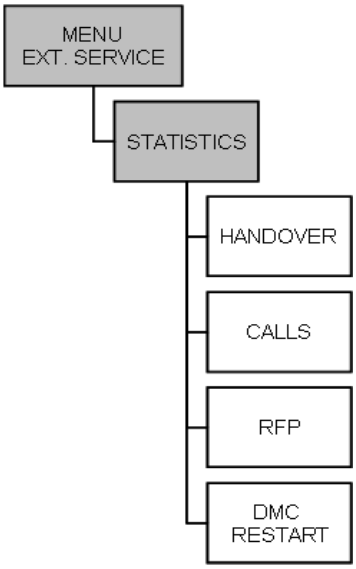
Both lines appear in the display. Use the < > keys to scroll to the next/previous base station.

Reading statistics from a Master handset

From the Master handset system a summary of statistics can be accessed on the following:

- handovers
- calls
- RFP (synchronizations and resets)
- DMC Restarts

Figure 84 Master handset: viewing statistics



Viewing handover statistics

1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **STATISTICS**.
3. Press ✓/**OK** - go to **HANDOVER**.
4. Press ✓/**OK**.
5. The display will show base station number 1 with the number of successful and failed handovers it has been handling. Use the < > keys to access statistics on the other base station.

Viewing call statistics

1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **STATISTICS**.
3. Press ✓/**OK** - go to **CALLS**.
4. Press ✓/**OK**.
5. The display will show base station number 1 with the total number of calls that has based through the base station and the number of busy calls. Use the < > keys to access statistics on the other base station.

Viewing base station resets statistics

1. Press **MENU** (≣) - go to **EXT. SERVICE**.
2. Press ✓/**OK** - go to **STATISTICS**.
3. Press ✓/**OK** - go to **RFP**.
4. Press ✓/**OK**.
5. The display will show base station number 1 with the total number of synchronizations and resets of the selected base station. Use the < > keys to access statistics on the other base station.

Viewing DMC restarts

1 Press **MENU** (≣) - go to **EXT. SERVICE**.

2 Press ✓/**OK** - go to **STATISTICS**.

3 Press ✓/**OK** - go to **DMC RESTART**.

4 Press ✓/**OK**.

5 The display will show date and time of the last DMC restart. Use the < > keys to access information on dates and times of the previous DMC restarts.

Advanced features

This section provides information about the advanced features in the:

- "DMC OAM program" on page 142
- "Digital Mobility Service Tool" on page 152

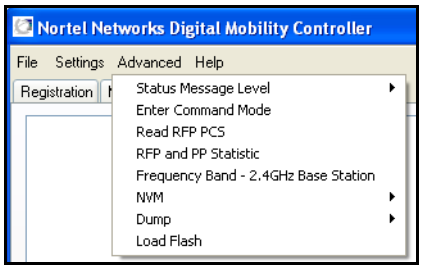
DMC OAM program

The **Advanced** menu in the DMC OAM program contains several commands used for debugging the system. It also contains a command for downloading software to the system.

Note: Use advanced settings only under the direction of your authorized service representative.

This section contains a description of each of these commands:

- "Status Message Level" on page 143
- "Enter Command Mode" on page 143
- "Read RFP PCS" on page 144
- "RFP and PP Statistic" on page 145
- "Frequency Band for 2.4GHz Base Station" on page 146
- "NVM (non-volatile memory)" on page 148
- "Dump" on page 149
- "Load Flash (updating software)" on page 150



Status Message Level

For more information, refer to “Checking Status Information” on page 131.

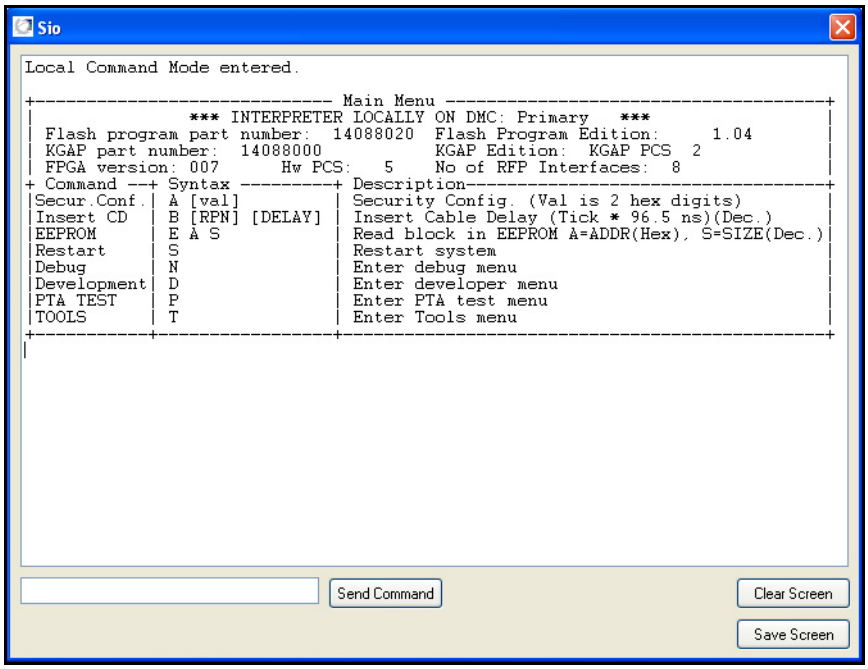
Enter Command Mode

Entering command mode gives the user a terminal connection menu (a text menu) defined by the DMC. In command mode it is possible to write text commands to the DMC and receive answers to these commands.

1 On the **Advanced** menu, click **Enter Command Mode**.

A **Sio** dialog box appears.

Figure 85 DMC OAM: Enter Command Mode


Sio
Local Command Mode entered.
Main Menu
*** INTERPRETER LOCALLY ON DMC: Primary ***
Flash program part number: 14088020 Flash Program Edition: 1.04
KGAP part number: 14088000 KGAP Edition: KGAP PCS 2
FPGA version: 007 Hw PCS: 5 No of RFP Interfaces: 8
Command | Syntax | Description
Secur.Conf. | A [val] | Security Config. (Val is 2 hex digits)
Insert CD | B [RPN] [DELAY] | Insert Cable Delay (Tick * 96.5 ns)(Dec.)
EEPROM | E A S | Read block in EEPROM A=ADDR(Hex), S=SIZE(Dec.)
Restart | S | Restart system
Debug | N | Enter debug menu
Development | D | Enter developer menu
PTA TEST | P | Enter PTA test menu
TOOLS | T | Enter Tools menu
Send Command
Clear Screen
Save Screen

2 Type a command, and then click **Send Command** to send it to the DMC.

The received answers from the DMC are displayed on the screen.

3 To save the data on the screen, click **Save Screen** and save the text in a file.

This is useful if you need further support from trained technicians as you can now send the data to them.

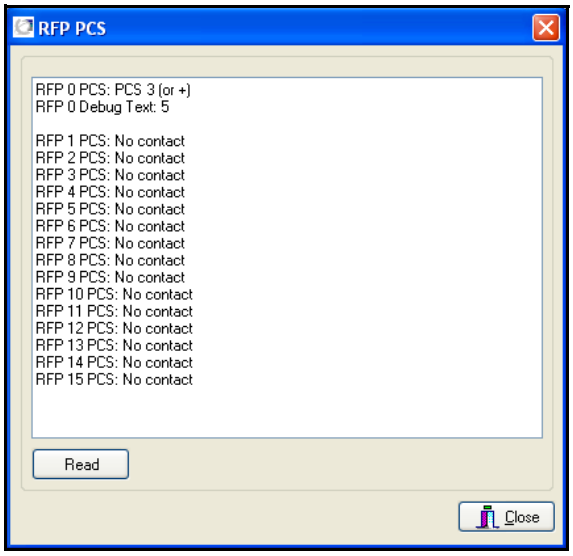
Read RFP PCS

The **Read RFP PCS** command requests the Product Change Status (PCS) from all base stations (RFPs). Using this command you can check if there is contact to the base stations. You can also compare the base stations and check software versions.

1 On the **Advanced** menu, click **Read RFP PCS**.

A **RFP PCS** dialog box appears.

Figure 86 DMC OAM: RRP Product Change Status


RFP PCS
RFP 0 PCS: PCS 3 (or +)
RFP 0 Debug Text: 5
RFP 1 PCS: No contact
RFP 2 PCS: No contact
RFP 3 PCS: No contact
RFP 4 PCS: No contact
RFP 5 PCS: No contact
RFP 6 PCS: No contact
RFP 7 PCS: No contact
RFP 8 PCS: No contact
RFP 9 PCS: No contact
RFP 10 PCS: No contact
RFP 11 PCS: No contact
RFP 12 PCS: No contact
RFP 13 PCS: No contact
RFP 14 PCS: No contact
RFP 15 PCS: No contact
Read
Close

2 Click **Read**.

The number of the base station (RFP) and the corresponding PCS is shown as a text string.

3 Click **Close** to close the dialog box.

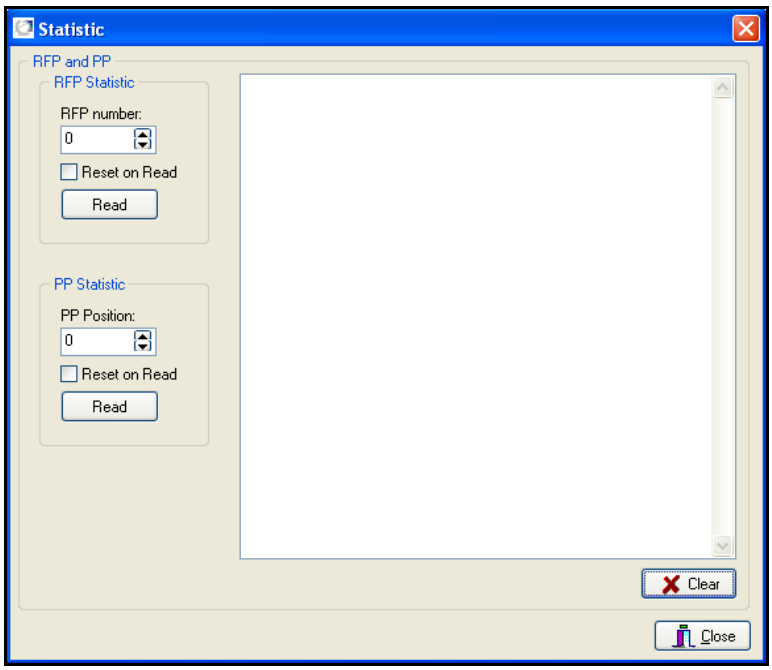
RFP and PP Statistic

Use this command to get statistic information from the base stations (RFPs) and the handsets (PPs).

1 On the **Advanced** menu, click **RFP and PP Statistic**.

A **Statistic** dialog box appears.

Figure 87 DMC OAM: RFP and PP statistics



The **Statistic** dialog box displays statistic records from base station and handset as text.

2 Select a device from either the **RFP number** list or the **PP number** list.

3 Optionally, you can select the **Reset on Read** check box if you want to reset all data when read.

4 Click **Read**.

The received statistic record contains data of the selected device: Handovers (success/fail), resets, sync errors, number of outgoing/incoming calls, time of the last statistic reset, etc.

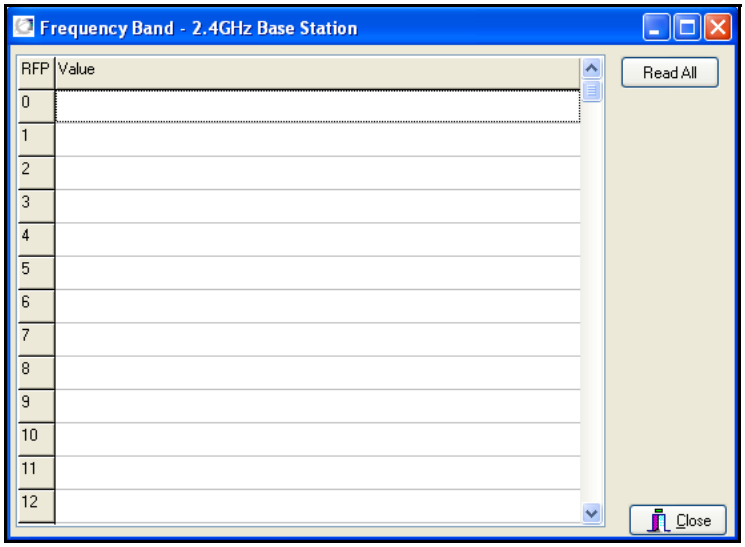
Frequency Band for 2.4GHz Base Station

Use this command in case of interference problems with other systems (such as e.g. 802.11B).

1 On the **Advanced** menu, click **Frequency Band 2.4GHz Base Station**.

A **Frequency Band 2.4GHz Base Station** dialog box appears.

Figure 88 DMC OAM: Frequency band (2.4GHz base station)



2 Click **Read All** to show the modes for each base station.

Each mode covers specific frequency bands.

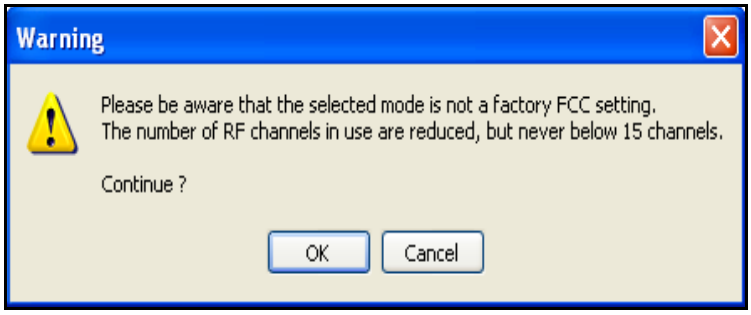
Table 17 Frequency bands

Mode	Frequency band
0	79 Channels (2.400780 - 2.481664 GHz)
2	Channels 0 - 14 (2.400780 - 2.416128 GHz)
3	Channels 32 - 46 (2.433548 - 2.448908 GHz)
4	Channels 64 - 78 (2.466304 - 2.481664 GHz)
5	Channels 0 -67 + 71 - 78 (2.400780 - 2.407936 GHz + 2.473472 - 2.481664 GHz)

3 To change frequency band for one or more base stations in order to narrow down the used frequency band, alternate-click on the base stations in question, and then select a new mode.

- If selecting **Mode 0**, the mode is changed without a confirmation request.
- If selecting **Mode 2-5**, a warning message appears.

Figure 89 DMC OAM: Frequency band mode change


Warning
Please be aware that the selected mode is not a factory FCC setting.
The number of RF channels in use are reduced, but never below 15 channels.
Continue ?
OK
Cancel

4 Click **OK** to confirm.

The DMC OAM program writes messages to the base stations to change the setup, and then it saves the new setup.

5 Click **Close**.

6 To use the new frequency bands you must restart the DMC.

- On the **Settings** menu, click **Restart DMC**.

The DMC is restarted. Restart time depends on system size. It can take a few seconds or a few minutes. When the DMC restart is complete, the hardware is ready to use again.

NVM (non-volatile memory)

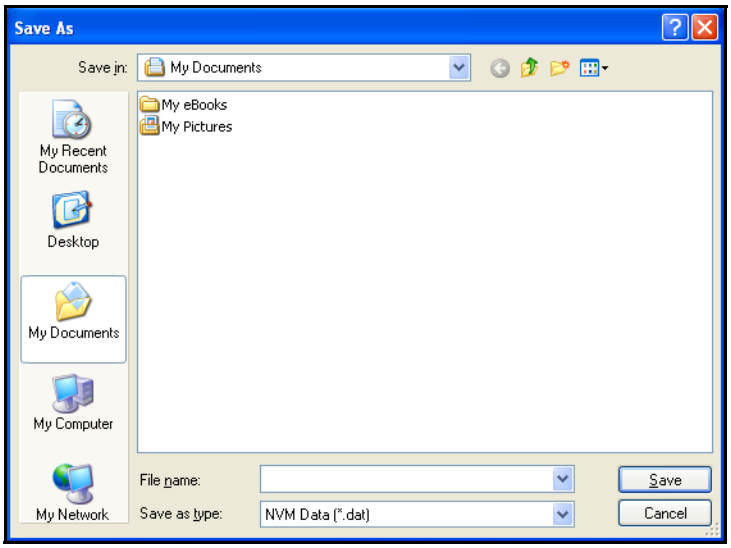
Use this command to make a backup of non-volatile memory from the DMC (EEPROM data) or to restore non-volatile memory. This is useful if you want to make a back up of your handset registration data and load registration data from the backup file (a binary file ***.dat**).

Making a backup of NVM from the DMC

1 On the **Advanced** menu, point to **NVM**, and then click **Backup**.

A **Save As** dialog box appears.

Figure 90 DMC OAM: Backup dialog



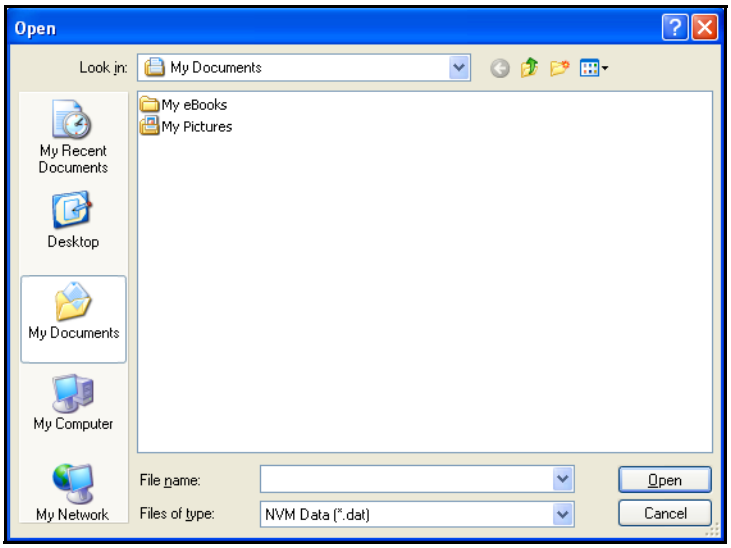
2 Indicate in which folder and under what name the file should be saved, and then click **Save**.

Loading data from a backup file

Data, such as registration data, can be loaded into the system from a backup file.

1 On the **Advanced** menu, point to **NVM**, and then click **Restore**.

An **Open** dialog box appears.



2 Select the file in question, and then click **Open**. The registration data is loaded to the system.

Note: If you are loading data from a backup file from another DMC, then all handsets must be resubscribed.

Dump

The **Dump** command is used for advanced debugging of the system. Use this command to log and save files containing data from the DMC on your harddisk. You can also use the **Dump** command to download a debug dump file from the DMC on your harddisk.

Note: Saving these files is only relevant if you have an agreement with your local service center.

How to log system data from the DMC

Before you start logging you can use the **Status** command (under **Advanced/Dump/Log**) to see wether the log is running or not.

1 On the **Advanced** menu, point to **Dump**, point to **Log**, and then click **Start**.

The log is started.

2 On the **Advanced** menu, point to **Dump**, point to **Log**, and then click **Stop** to stop the log. The log file is saved on the DMC.

3 On the **Advanced** menu, point to **Dump**, point to **Log**, and then click **Log Dump** to copy the log file from the DMC to your harddisk.

4 When the log file is saved on your harddisk, you can send it to your local service center.

How to download a debug dump file from the DMC

If the DMC is restarted, the reason for the restart is saved internally on the DMC. To download the file to your harddisk:

1 On the **Advanced** menu, point to **Dump**, and then click **Debug Dump**.

The file is downloaded from the DMC to your harddisk.

2 You can now send the file to your local service center.

Load Flash (updating software)

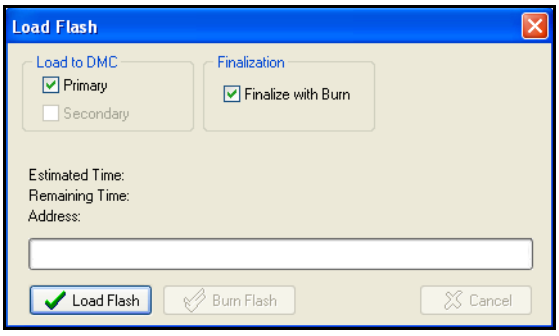
The **Load Flash** command is used when the system software needs to be replaced by e.g. a new release or a software update. To update the DMC software you load a flash to the system (Primary, Secondary or both). Contact your distributor for newest software.

Note: A system can consist of two DMCs. In such a case, the first DMC is referred to as the Primary DMC; the second, which is connected to the Primary DMC, is referred to as the Secondary DMC. For more information about Primary and Secondary DMCs, refer to "Digital Mobility Controller (DMC)" on page 28.

1 On the **Advanced** menu, click **Load Flash**.

A **Load Flash** dialog box appears.

Figure 91 DMC OAM: Load flash



2 Select either the **Primary** or **Secondary** check box or both.

3 You can burn the flash in two way:

Note: Burning the flash will set the system offline and the DMC is restarted after the burn (this will have an impact on currently users).

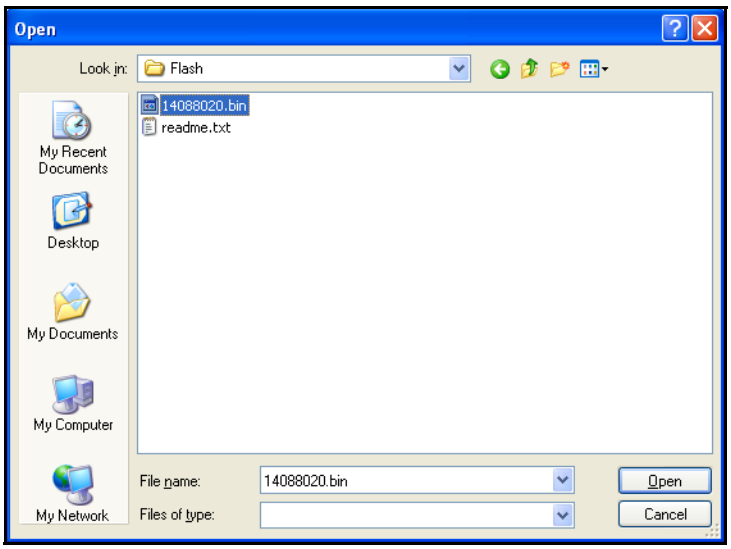
- If you want to burn the flash immediately after the loading of the flash, select the **Finalize with Burn** check box.
- You can also choose to burn the flash later, when no users will be disturbed by the system going offline. This is done by clicking the **Burn Flash** button AFTER the flash has been loaded to the system.

4 Click **Load Flash** to load the flash to the system.

The flash is loaded to RAM, so that the system does not need to be offline when loading the flash.

An **Open** dialog box appears.

Figure 92 DMC OAM: Load flash file location



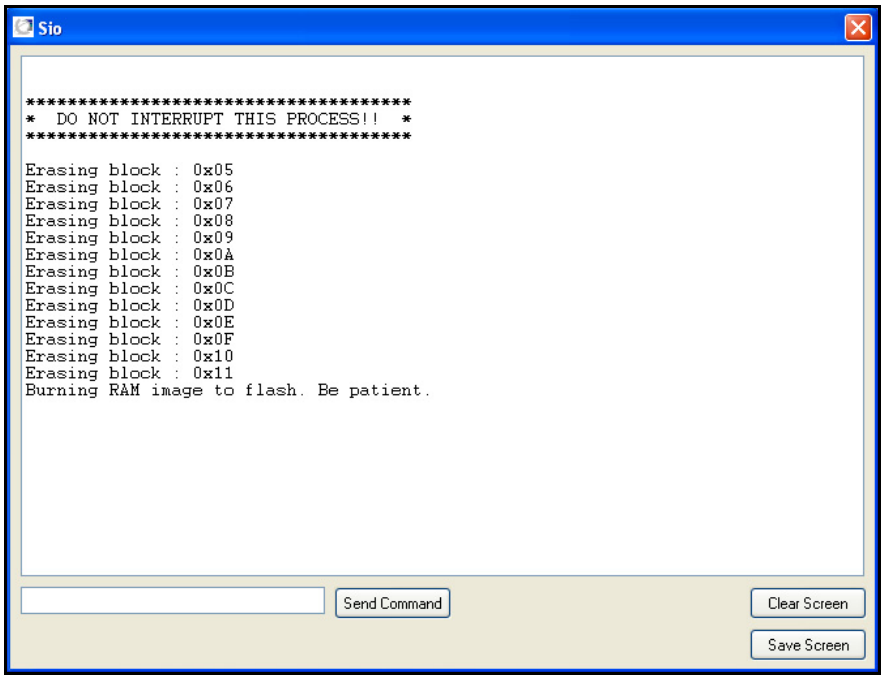
5 Select the flash to be uploaded, and then click **Open**.

6 After loading the flash, the flash is burned automatically if you have selected the **Finalize with Burn** check box. Otherwise you can click on the **Burn Flash** button.

When the flash currently in RAM is written to the DMC flash the system will be offline.

The following **Sio** dialog box appears.

Figure 93 Flash burn Sio dialog



After the burn, the DMC is restarted.

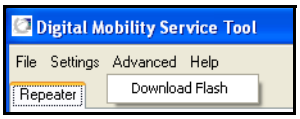
Note: If power failure occurs while burning the flash, the uploaded flash is corrupted and the system cannot operate. Contact your authorized service representative for assistance.

Digital Mobility Service Tool

The **Advanced** menu in the Digital Mobility Service Tool contains a **Download Flash** command used for downloading new software to repeater or handset.

This section contains a description of:

- “Download Flash” on page 153



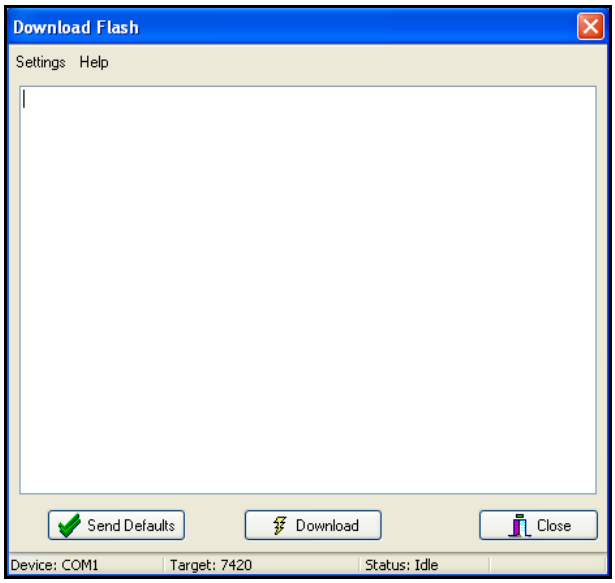
Download Flash

1 Before you start downloading flash to the repeater or handset, ensure that the repeater is connected to the computer and the mains or that the programming stand or charger for the handset is connected to the computer and that the handset is placed in the programming stand/ charger. Refer to "Set up of the hardware for repeater programming:" on page 77 or refer to "Set up of the hardware for handset adjustment:" on page 133.

2 On the **Advanced** menu, click **Load Flash**.

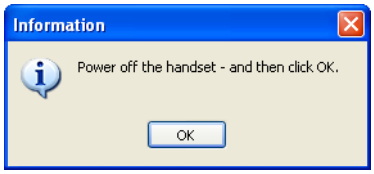
A **Download Flash** dialog box appears.

Figure 94 Digital Mobility Service Tool: Download Flash dialog



3 Click **Download**.

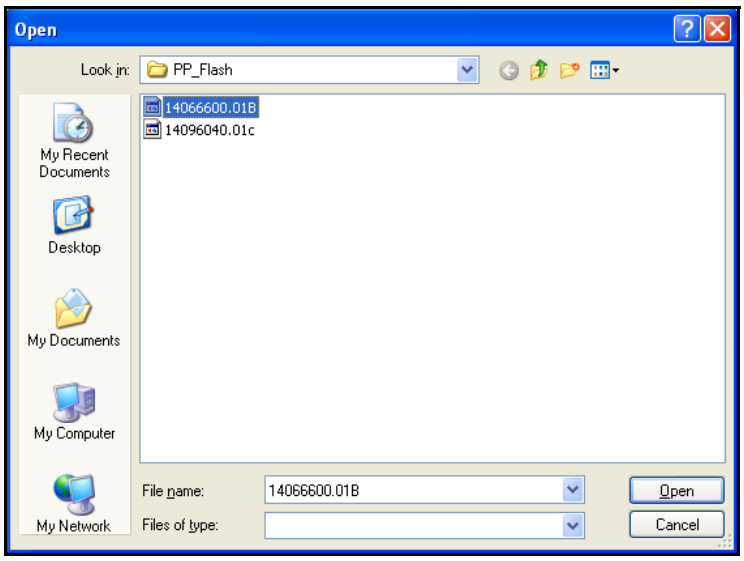
4 An information dialog box appears.



5 Turn off the repeater or handset, and then click **OK**.

An **Open** dialog box appears.

Figure 95 Digital Mobility Service Tool: Finding the file to download to Flash



6 Select the file in question, and then click **Open**.

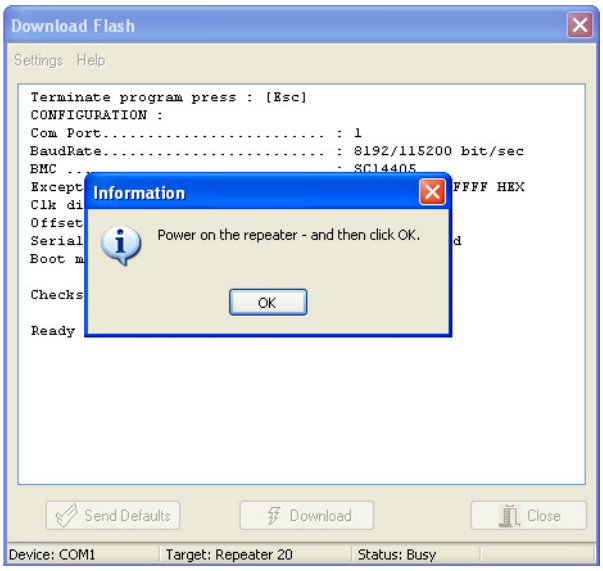
7 If you are downloading software to a handset:

Turn the handset on:

- Press the handset **Hook** key + the keyboard **ENTER** key to start downloading the software. Keep pressing the **Hook** key until the download is in progress (check the messages on the screen).

8 If you are downloading software to a repeater:

An information dialog box appears.



- Replace the adapter in the power supply, and then click **OK**.

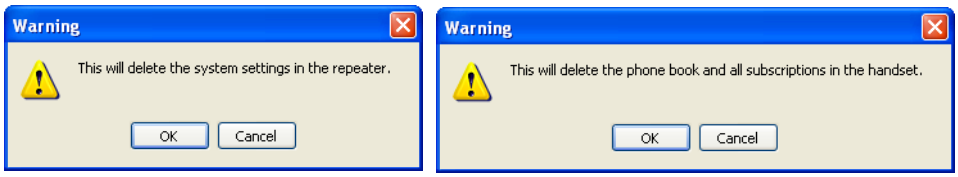
  The software is downloaded.

9 A completion message displays on the screen when the download is completed.

10 Cycle the power of the repeater or handset.

11 Click **Send Defaults**.

A warning message appears.



12 Click **OK** to confirm.

The repeater or handset is now reset to factory defaults of the new software.

13 Click **Close**.

Troubleshooting error messages

This section provides you with general troubleshooting information about system problems and error messages that may occur when working with the DMC OAM program or the Digital Mobility Service Tool.

This section contains information about error messages in:

- "DMC OAM program" on page 156
- "Digital Mobility Service Tool" on page 157

DMC OAM program

The error messages that may occur in the DMC OAM program are described in the following table.

Table 18 Error messages in DMC OAM program

Problem	Action required
NVM Restore Error	Try to restore the NVM again or contact your local service center.
Both "Suppression Activate Level" and "Suppression" must set!	You need to set both values.
Please select a valid serial device	Select a valid serial device. Contact your system administrator.
Checksum Error	Try to download flash again.
Flash Load Error	Check your cable connections, and then try to load the flash again.
Illegal Request	The request is not supported by the DMC. Check if DMC OAM program and DMC are compatible.
Unknown Request	The request is not known by the DMC. Check if DMC OAM program and DMC are compatible.
TCM is in use!	You must select an empty TCM or delete current user before you can register a new user.
No user on TCM	You must register a user.
IPEI must be 12 characters long!!	Type a correct IPEI number. 5 + 7 characters.

Digital Mobility Service Tool

The error messages that may occur in the Digital Mobility Service Tool are described in the following table.

Table 19 Error messages in Digital Mobility Service Tool

Problem	Action required
Serial device unavailable!	The chosen Com port does not exist. The Com port (e.g. USB Com port converter) may have been removed - if so - connect the Com port again or choose another valid Com port using the Connection Settings command.
Could not open serial device	The Com port is in use by another program. You can either shut down this program or move the serial cable to another Com port, and then change to this Com port using the Connection Settings command.
Could not read from target	Check if the target is connected to the serial cable (e.g. handset is not correctly placed in the charger) or if target is turned off. Check if the wrong target has been chosen - if so - select the right target using the Connection Settings command.
Could not write to target	Check if the target is connected to the serial cable (e.g. handset is not correctly placed in the charger) or if target is turned off. Check if the wrong target has been chosen - if so - select the right target using the Connection Settings command.
Could not connect to device! The device must be ON when sending defaults.	Check if the target is connected to the serial cable or if target is turned off.
The flash file could not be found	If you typed the file name check if the file name is correct. If you selected a file over the network check if the network is running.

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